



CRANFIELD UNIVERSITY

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**A 'PROCESS' APPROACH TO THE
TECHNOLOGICAL, ORGANISATIONAL AND STRATEGIC
ROLE OF TRAINING**

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**A 'process' approach to the
technological, organisational and strategic role of training**

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ABSTRACT

The origins of this work are in understanding the difficulties that organisations face in developing and using technology based training (TBT). However it is the organisational context within which these technological changes take place that is of particular interest. The objective of this thesis is to use concepts and models of cumulative knowledge in organisations to investigate the limitations of conventional training centred approaches.

The research design is centred around the question: Is the failure of conventional training, in meeting organisational needs, due to it being used as a project, task centred 'function' rather than being process centred? This question is explored by:

identifying, in a diverse set of organisations, the nature of 'failures' and limitations of the conventional training function from which it is possible to structure an approach that draws upon models of training and knowledge;

using models of knowledge accumulation, process models, to examine the limitations of task and functional models of training.

The research activity includes the use of an innovative training package based on trouble-shooter training, and carefully focused interactive activities with line managers in three very different types of organisation. For each of these groups knowledge issues and training are of evident concern.

The research shows that contributions to knowledge gain within an organisation can be uncovered and supported if specific patterns and structures are identified. It is clear that there is little difficulty in identifying the value of specific knowledge types in functional or technical domains if the timing of the skill required can also be determined. Further, it is clear that problems arise when senior managers focus on developmental knowledge and specify skill requirements in advance of the preparedness of line managers. In such cases learning benefits are likely to be restricted by a lack of structural change in the organisation required to exploit such training.

In addition the thesis makes a contribution to the development of a composite training and cumulative knowledge model by:

clarifying the various dimensions of training and knowledge relevant to knowledge exploitation, and;

the identification of the role of exploitation as the potential point of interaction between individual and organisational learning models.

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*This thesis is dedicated to the memories of Joseph Peter & Luke John Longhurst
(17 Sept. - 23 Sept. 1991, & - 2 Dec. 1991)
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CHAPTER 1

1. Research context and thesis structure

The objective of this study is to use concepts and models of cumulative knowledge in organisations to investigate the limitations of conventional training centred approaches for the knowledge needs of managers. The research then considers the further implications of training centred approaches for knowledge needs to establish and maintain organisational change.

1.1 Origins of the research

This thesis studies the context in which formal learning provision in organisations, and its outcomes, take place. It considers the relationship between organisational structure, organisational type, and the functional roles of staff and their knowledge requirements that have implications for both the provision of and benefits received from this form of knowledge acquisition. The origins of this work are in understanding the difficulties that organisations face when developing and using technology based training (TBT). However it is the organisational context within which these technological changes take place that is of particular interest.

As a result of a project undertaken by the Innovation & Technology Assessment Unit at Cranfield University for CEST (Centre for Exploitation of Science & Technology) in the demand for 'Interactive Video' the importance of issues about training, training organisations and management, and the strategic role of training became apparent. This research builds upon this early study whilst collaborating with a number of commercial and public organisations and with the support of an SERC Total Technology research studentship.

The thesis shows that the wider issues raised by this initial technology assessment require investigation in order to expose the interrelationships between the 'production and consumption of training technology' and the role of managers in determining the benefits of training to companies.

While the research started with an orthodox technology assessment focus it developed to consider the provision and use of training, or formal learning experiences, from three perspectives. These are referred to in this thesis as the hierarchical or 'organisational' view of training, the role of the 'individual' in their response to training, and the role of 'managers'. Each of these are involved in the specification of learning and the adaptation of the work environment to maximise the opportunities which can arise from the provision of formal learning. The research has established a better understanding of the managers' role in staff training. Central to this understanding is the role played by practical research activity for the provision of a working knowledge about training related issues and the development of research techniques to achieve this. The author has generated much of the fieldwork activity from action research involvement as a qualified teacher of technology. This has been possible by contributing professionally to

the design and delivery of a number of organisationally based training programmes as well as consultancy.

1.2 The focus of research

This study originates from concerns about the critical assessment of investments in learning within organisations and the difficulties created by certain types of training. Much of the established training literature includes assessment methods to identify the value of this formal learning. However, commonly studies specify distinct organisational levels at which to perform assessments and with which to match training objectives. This provides a narrow level of training performance testing to see if targets have been met. Dickinson (1973), illustrates this practice with a 'circle of evaluation' identifying the behavioural objectives and their reference to the organisation.

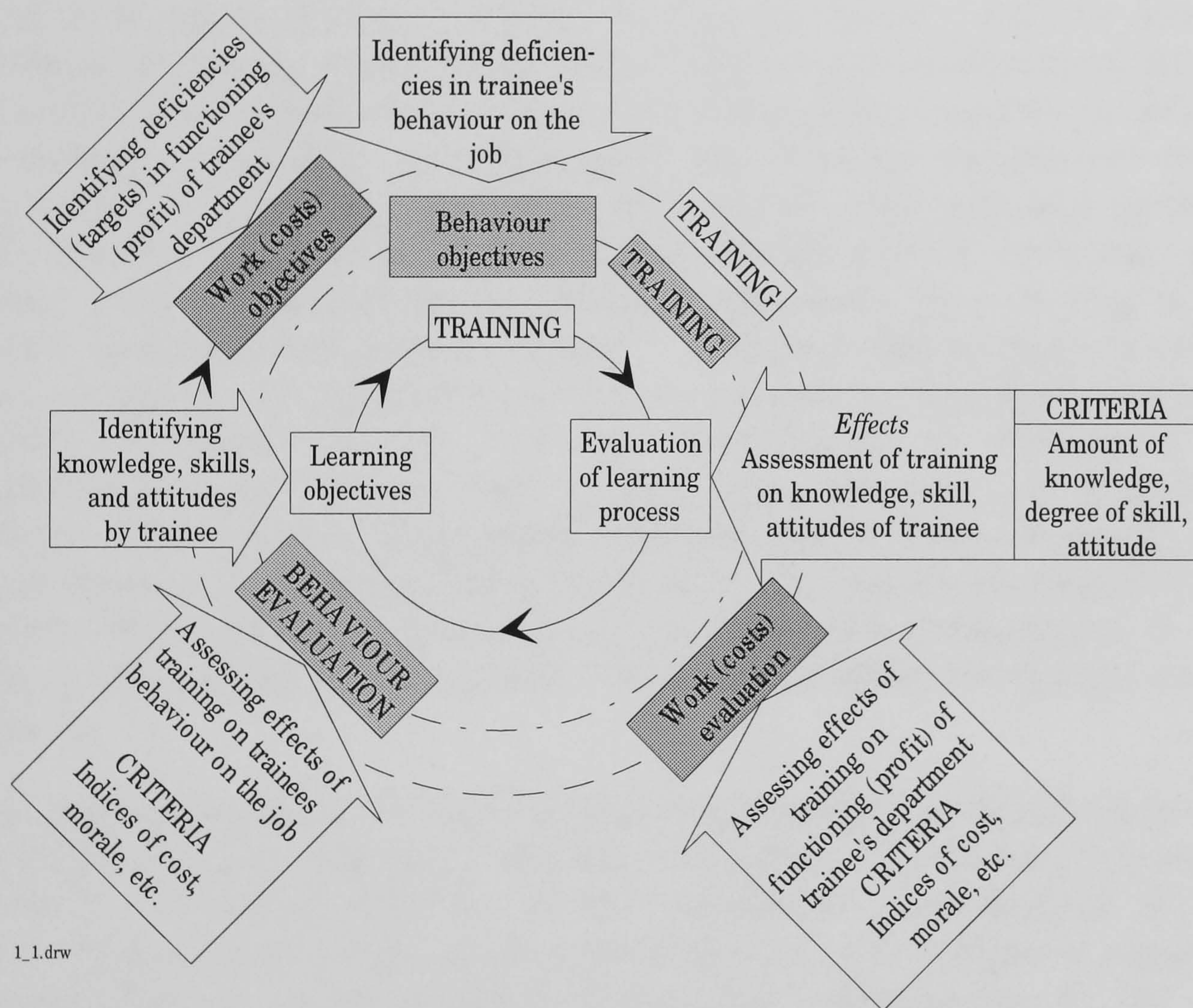


Figure 1.1 Circle of evaluation (Dickinson, 1973)

This approach to evaluation is informative where specific skills are needed and these needs are agreed within the firm. In small organisations the communication of knowledge needs is often easy or unnecessary. Yet it is the varying nature of knowledge specification and the agreement of knowledge needs within the variety of large and differing organisational structures which often results in difficulties. Under these conditions assessment processes addressing single level objectives are unable to inform about the success or failure of investments in knowledge. Evidence knowledge management problems may be found more clearly when a performance is not being met, or appears unlikely to be met in the future. In organisations which have a limited

number of skill based tasks and one level of management to ensure a response to change this seems less likely to occur. However, there are few large organisations as simple as this. Modern organisations with a need to provide vocational learning on a wide scale are increasingly characterised by flatter and less complex structures. This to some extent overcomes the problems, identified in 1.3, where an apparent lack of congruence is evident between the training objectives at one level and the objectives for knowledge specified at other levels within the organisation. It appears that in determining knowledge requirements i.e. skill or performance needs to meet current and future conditions, it is necessary to understand more about the nature of knowledge types and the mechanisms by which organisations can provide these learning experiences. If appropriate learning, relevant to agreed needs, is known to have taken place then an opportunity for enhanced performance should exist; frequently this seems to not be the case.

If the imperative for knowledge provision prevails and learning objectives can be assumed to be agreed between providers and learners then it would be possible for organisations to identify opportunities where learning and its benefits could make a return on this training investment. Clearly this assumption is incorrect in many cases where training is provided. Learning experiences in many organisations frequently appear to fail to reward an organisation, and its staff, with enhanced performance. Bramley (1989), referring to earlier work by Katz and Khan (1978) notes that, ‘attempts to change parts of organisations by changing individuals have “a long history of theoretical inadequacy and practical failure”.’ It appears that to establish objectives, policies, structures and procedures within an organisation can itself challenge the immediacy of change arising from the development of individuals. This ‘institutionalisation of learning’ then in turn limits the value of investments in knowledge. Therefore it is inappropriate to assume that by solely improving learning the performance of staff can be achieved in all cases. By focusing investigation on these differences between learning provision and organisational characteristics it may be possible to gain insights into the potential of success or failure for specific knowledge applications.

The argument within this thesis supports the belief that improved benefits from training and learning provision can help overcome difficulties in achieving organisational performance. However, evidence of the technological contributions to training provision suggest that in certain circumstances little or no gain is made in organisational performance, nor in future potential, from these enhancements to the learning environment. This is surprising when both individuals and managers in an organisation can agree upon the validity of planned learning and the effectiveness of its provision. Therefore an important area to explore is how managers in organisations identify their knowledge needs, express these functionally to individuals and ensure that this learning takes place and is assimilated within the organisation. It seems that if a typology of knowledge could be formed it may then be possible to relate training provision to a matching typology of organisational characteristics. If this is were possible then insights into the knowledge management characteristics for many organisations could be achieved.

The difficulties of determining organisational performance outcomes from learning are consistent with many problems where an analysis at one level provides only limited understanding of the process at a wider or macro systemic level. Systemic approaches recognise the significance of selecting appropriate indicators or variables at one level of analysis that can inform about the change process at the next level (Checkland, 1979). Established approaches overcome this problem by bounding the system of interest and then drawing conclusions about this part of the system and relating one level of analysis in order to address the next level. For research in organisations whenever the method is dependant upon a criteria of selectivity with which to identify what are the parameters of change that should be observed a typology with which to base this criteria of selectivity is necessary. In the case of learning within organisations, systematic methods cannot guide the study of training without recognising that different learning approaches may be addressed to meet different forms of change and thus different indicators.

This thesis establishes a conceptual structure or typology by which to analyse selectively the consequences, at differing levels, of training provision in an organisation. The research design takes an analysis of three perspectives across a number of organisations. By examining these different views the issues facing operational staff, managers at senior levels and managers responsible for the performance and development of operational staff are identified with respect to the provision of knowledge by each of the 12 case study organisations.

1.3 References to technology based training (TBT) within the research

An attempt to capture the ‘issue’ related themes of this thesis from a practitioner’s point of view was made in the form of a publication to a practitioner journal by this author. This article was published in the *Training Officer* journal (Longhurst, 1993) and formed the basis of work with a number of organisations on the theme of ‘technology based training’ (TBT). Although the early research activity into technology based training does not form a significant part of the thesis, it is relevant background material which demonstrates why the early research focused on training technology in organisations. The paper in Appendix A also provides useful background to the research activities where training technology was being used by the companies referred to.

The term technology based training is used within the thesis to refer specifically to ‘interactive media’, that is, those systems developed for the commercial training market which are PC based and use laser or magneto-optical technology to store and access text, sound, graphics and moving pictures. These systems have more recently been adapted for the wider domestic multimedia market in the form of PC and CD-ROM or CD-I systems. Figure 1.2 illustrates the range of technologies applicable to training. These encompass the majority of media formats and an increasing number of communications and data storage technologies.

This early research quickly resulted in the identification of key difficulties of investments in training technology and of the identification of benefits from large scale resource decisions in the provision of training.

Media Type	Technology	Technological developments
Static	Text / Tape Audio-visual Radio / TV	
Dynamic Media	Film / Video	Extended play video tapes
Interactive Media	Computers-CAL, CAI, CBT, CD-ROM,	Laser disc technology, Data storage on digital discs-compressed data CD-ROM, File standards,
'Multimedia'	Interactive Video-IVI, CD-DA, CD-I	Operating system speeds, Computer memory, input devices, erasable disc technology
Telecommunications	Satellite linking of study centres, increased distribution of networks	
Video-text		
Information Utilities		increased distribution and storage

Figure 1.2 Media types, technology and developments

The main effect that the introduction of training media has on firms is the generation of significant managerial interest from outside the normal boundaries of the training function. This wider managerial interest thus requires a more explicit negotiation of learning objectives between management and staff than has often been the case. Changes in the negotiation of training investment brings with it further implications for identifying the benefits from training and agreeing the specification of knowledge needs for managers, and the organisation as a whole. This interest in training investment is particularly relevant where managerial levels above those of the trainees' own line managers become directly involved.

Historically training design has usually consisted of a limited dialogue between the trainer, manager and trainee each with a functional role in the organisation's performance. With the advent of interactive training technologies, and the resulting large scale investments, the trainer, and senior managers have had to agree common objectives between functional roles. This is often in response to the requirements for internal accounting procedures for training proposals. Paradoxically the technologies which appeared favourable because of their independence from the changing agendas of individuals, managers, and trainers has generated a dependence on each of these groups for financial accountability and organisational success. Most noticeably, the role of managers' responsibility for training their staff increases in organisational visibility.

The significance of the problems in specifying and identifying value from formal learning processes was apparent in the early work supported by CEST. Indeed one of the conclusions of the report to CEST (1989) by INTA states:

'At the next level the issue is the extent to which the objective of the training improves business performance. There does not appear to be an adequate understanding of this relationship although almost everyone contacted in this project was alert and concerned about it. Without an adequate formal evaluation process at all levels it is difficult to see how the choice of one training medium or another, or combinations, can be made systematically. The additional costs of training may be more than offset by improved business performance. If there are opportunities for training for which IVI, or any other medium, is particularly suited those opportunities are less likely to be exploited

if the only formal criteria is cost-effectiveness at the point of delivery of training.' (CEST, 1989:13)

If the benefits from acquiring knowledge through a formal learning process cannot be easily identified it makes organisational commitments, in financial or other resource forms, very difficult. The distinction that became evident within this early work was that a number of organisations were able, to a greater or lesser extent, to place a value on investments in learning. These differences could often be noted more easily either by the organisation's structure, nature of task or location in the market place. What was not clear on completion of the CEST study was the nature of these organisational and operational types and what could be done to understand how management could reflect upon where to identify the benefits of training to the processes of organisational change.

It was evident from this work that the problems of evaluating training were neither new to TBT nor specific to any single organisation or market sector. TBT thus provided a research opportunity with which to focus on the differences in perspective between 'knowledge investors', those 'specifying performance' and 'knowledge users' i.e. the organisation, line managers and line-staff respectively. Of particular interest were situations where hierarchical levels were collapsed to a minimum by technological change. It is proposed that by understanding these unique situations, insights to the problems of managing knowledge within an organisation can be gained.

1.4 The structure of the thesis

The research described in this thesis applies an understanding of organisational characteristics, managerial perspectives, and knowledge of functional roles to study knowledge management from training provision. The value of this approach is in achieving optimum approaches with which to assimilate knowledge in an organisation.

From these research questions it can be seen that the identification of the issues related to assimilation arising from current training models is needed. It is then possible to investigate the properties of models of knowledge accumulation as a means of understanding the failure of conventional training functions. Such an understanding then enables consideration of the contribution that training makes to knowledge based organisations and the managerial issues that arise from conventional training.

Following this section Chapter 2 reviews perspectives presented from research focused on training and formal learning provision. On the one the hand, macro level analysis of knowledge in organisations is drawn upon, and on the other, research that sets out to understand the relationship between the organisation and the individual is considered.

Chapter 3 discusses the need for a research design that is able to directly address the issues of understanding knowledge requirements within varied organisations and the need to provide a coherent framework to make comparisons across organisations. This has clear implications for research design and the development of a method by which the staff in organisations can focus their experiences of formal learning and explain their knowledge needs through experience. The chronology of fieldwork activities is

presented and the research devices used to identify distinct perspectives within an organisation are explained.

A map of the thesis structure illustrating the information flows through the thesis shown in Figure 1.3 below.

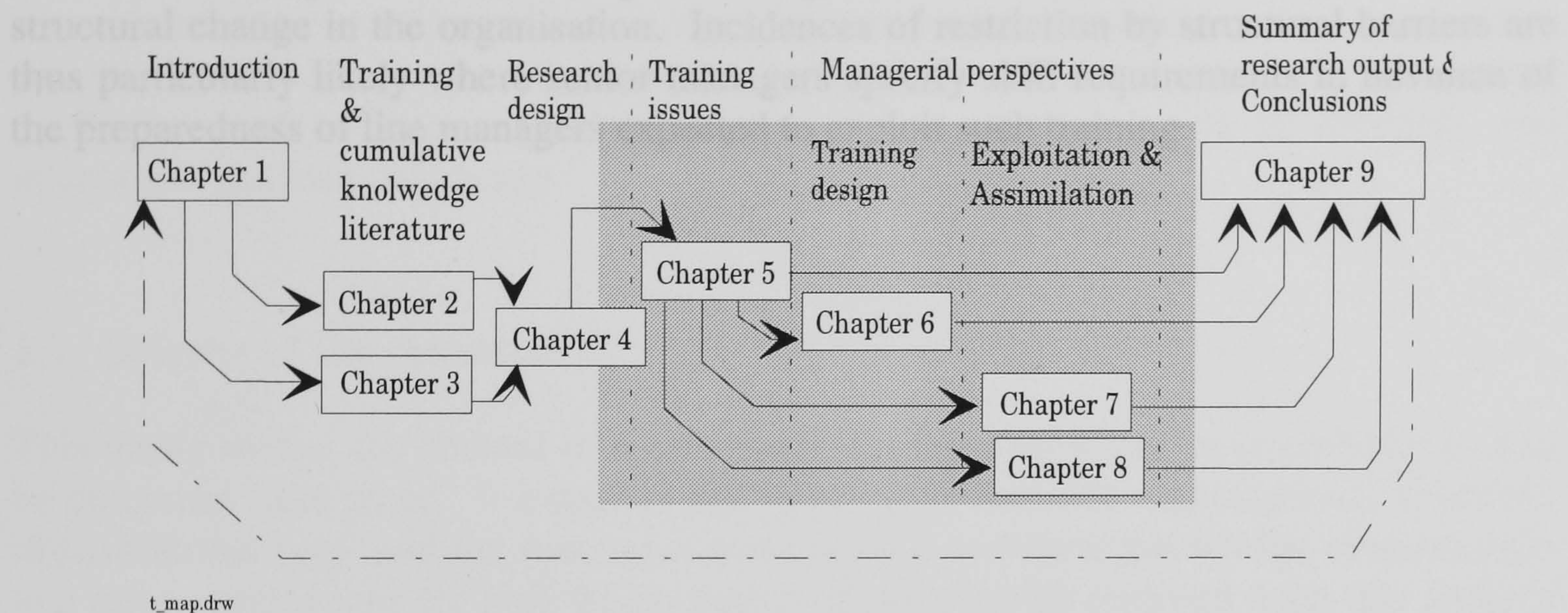


Figure 1.3 Map of thesis structure

From the discussion of research design, Chapter 4 examines the issues facing organisations when specifying knowledge for their own needs. Research evidence is produced that reveals the ease with which some organisations are able to identify requirements for formal learning in contrast to the difficulties presented by other forms of organisational structure or operational function.

Chapter 5 presents further fieldwork on the key issues which are faced by staff who are required by their line managers to acquire specific types of knowledge in order to benefit their organisation directly from training. The selection criteria adopted for the case study examples is described in Chapter 4 and a summary of the training issues of each organisation within Chapter 5.

The results from a study of managers responsible for both the operational performance of a group of staff and their training development are presented in Chapters 6, 7 and 8. This managerial perspective provides a clear insight as to the problems faced when specifying the operational requirements of an organisation alongside the difficulties that arise when limited opportunities exist for managers to enable structural change of the work context and job boundaries to benefit operations.

Chapter 9 collates the fieldwork activities and summarises their output in a series of matrices representing differing organisational forms, knowledge types and operational characteristics. The results from the fieldwork are then reviewed with respect to existing models of learning assimilation in organisations. Finally Chapter 9 examines the contribution of the research to the specification of a framework with which to interpret the difficulties encountered at the training level for managing knowledge in an organisation.

From this research it is evident that contributions to enhance knowledge gain within an organisation can be uncovered and maintained if specific patterns and structures are identified. It is clear that there is little difficulty in identifying the value of specific knowledge types in functional or technical domains when the relevance of skill requirements can be determined. Further, it is clear that where managers at higher levels focus on developmental knowledge learning benefits can be restricted by a lack of structural change in the organisation. Incidences of restriction by structural barriers are thus particularly likely where senior managers specify skill requirements in advance of the preparedness of line managers expected to exploit such training.

CHAPTER 2

2. Conventional applications of training for learning in organisations: theory and practice

This chapter selects ideas from literature on formal learning by training and the benefits of that learning in an organisation. The chapter introduces the research literature on formalised learning in organisations and then refers to models of training practice and the implications for an organisational curriculum of 'knowledge'. The basis of this literature originates from the constructs upon which the evaluation of learning is based. These approaches to valuing benefits then direct the research to focus on an appraisal of training and knowledge types and linking the concept of knowledge in an organisation to formalised learning and training practice.

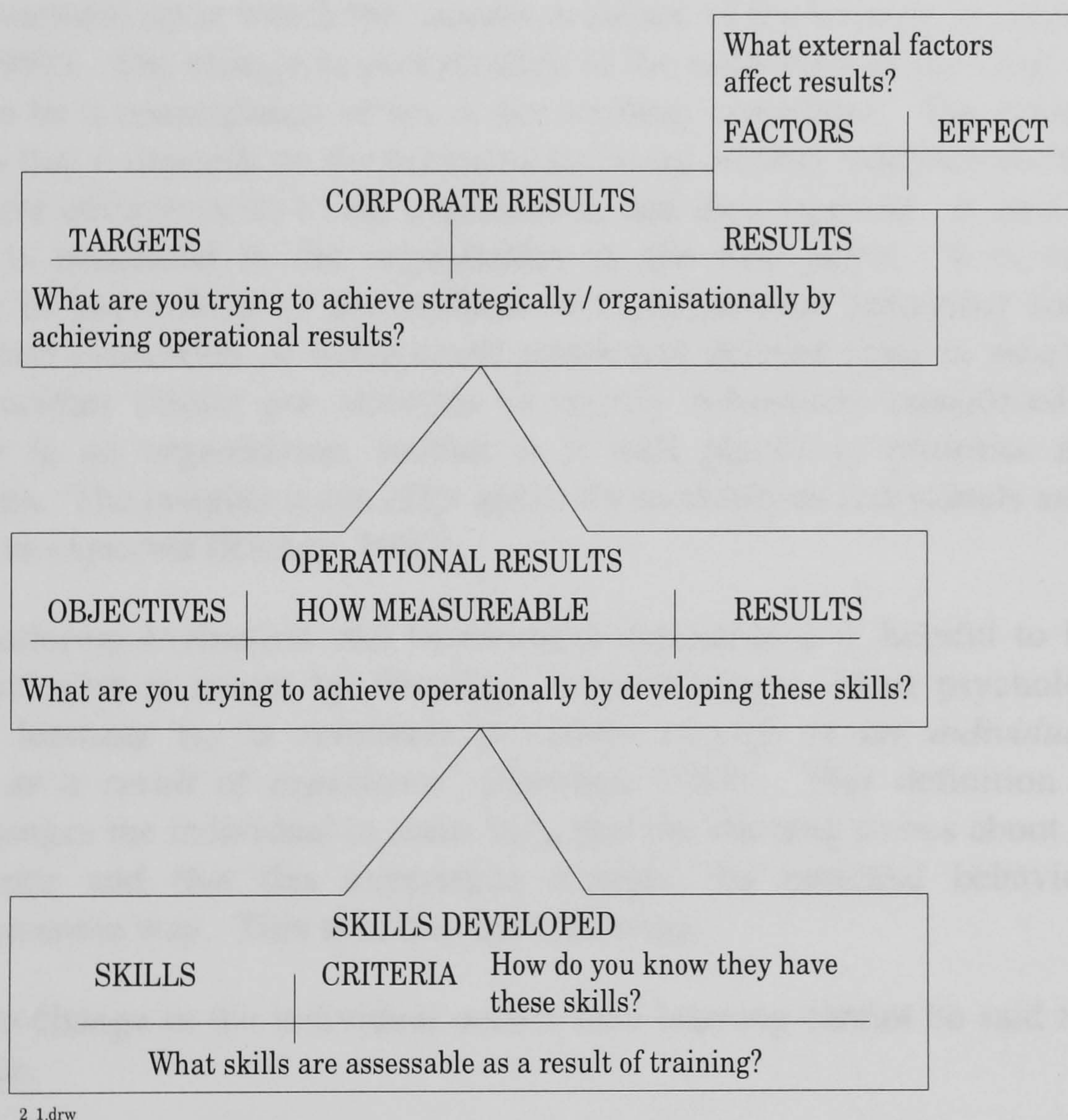


Figure 2.1 Template for evaluation (from Jackson 1989)

The question of who in an organisation should specify particular forms of learning as appropriate and who is in the best position to define learning needs has direct implications for identifying the benefits of investment in learning. For an organisation to fully appreciate its benefits from training it must know something of the relationship between what the trainee is taught and how pertinent this is to the priorities of the organisation. It is proposed that the appropriate definition of a training function,

whether this be a department or activity, is as important as the ability of trainers and managers to provide effective learning experiences to an organisation's employees.

2.1.1 Indicators of behavioural learning

The organisational psychology literature provides a useful foundation for understanding changes in the behaviour of individuals and groups in clearly defined environments. This approach has been related to training evaluation since before the first world war. Taylor (1911) in *'The Principles of Scientific Management'* makes a clear recommendation for selecting the best workers for specific tasks and then providing them with extensive training. The indicators used to understand organisational behaviour as a result of training are derived from theoretical constructs of changes in individual and group behaviours that are likely to benefit the organisation (Huber, 1991). Observed behaviours form the basis of this evaluation and represent the dependant variable upon which the success or failure of the training is judged (Friedman & Farag, 1991). The change in performance of the individual in the 'test' environment is judged to be a consequence of his or her training experience. The limitation of this approach is that it depends on the performance being reliably maintained and transferred (from the test environment) to the organisation and then repeated. It also assumes this behaviour is beneficial to the organisation in the first place. It is clear that the application of psychology to the analysis of organisational behaviour focuses on the definition and evaluation of behavioural constructs defined prior to assessment. The discipline neither claims nor attempts to specify behaviours considered to be most appropriate in an organisation, neither is it well placed to prioritise the needs of organisations. The insights it can offer are to the tendency of individuals and groups not to perform as expected (Richey, 1986).

When considering evaluation and behavioural indicators it is helpful to begin with a definition of what is meant by 'learning' in psychology. Most psychologists would agree that learning is, *'a relatively persistent change in an individual's possible behaviour as a result of experience'* (Fontana, 1981). This definition implies that learning changes the individual in some way, that the learning comes about as a result of an experience and that this experience changes the potential behaviours of that individual in some way. This specifies the following:

- If no change in the individual occurs then learning cannot be said to have taken place.
- There is a need to gain experience in some form. This excludes normal maturation and physical development from learning.
- Emphasis is placed on a change in an individual's potential behaviour as opposed to its confirmation from actual performance.

Of particular interest within this definition is the 'potential' to change behaviours i.e. the distinction made between learning and behaviour. This anticipation of an ability to behave differently, in psychological terms, is a specific reference to the individual

process of cognition. Approaches to understanding individual cognition are elegantly summarised by Meadows (1993):

'... there are a number of problems in the background, stretching right back to psychology's unresolved tension between its two definitions as "the science of mental life" and "the science of behaviour". At one level cognition is what people can be observed to do when they have to think, learn, remember, understand, judge, use concepts and so forth; at another it is the system behind these different abilities. Researchers focus on one level rather than another, just as they differ on whether they attend to the formal properties of a cognitive system or to the material it is made of, when seeking to explain why it works as it does.' (Meadows, 1993).

A person may learn something and not demonstrate this learning for months or years. A particular interest in training is in drawing the relationship between the experience of learning and its demonstration in the work-place as close as possible. Two broad explanations of learning are reflected in the psychology literature. These are pertinent to the evaluative constructs used within training.

The behaviourist school of thought, known as 'operant-conditioning' includes the work of the American psychologist B.F. Skinner, who carried out extensive experimental investigations into learning. Skinner (1969) argues that the learning act involves three identifiable stages: first, the stimulus or situation with which the learner is confronted; second, the behaviour which it elicits from him or her; and third, the reinforcement which follows this behaviour. This reinforcement is either positive or negative and commonly referred to as encouragement or discouragement. In many computer technology based systems this attribute can best be seen in the branching or routing sequence that confirms correct answers from a trainee and results in progression through the training sequence. Incorrect answers route the trainee through the learning sequence once more in an attempt to prevent this same 'incorrect' behaviour. The belief is that such positive reinforcement of correct behaviour will increase the likelihood of behaviour recurring whilst negative reinforcement will decrease it (Gibbs, 1992).

'Instrumental conceptualism', or the cognitive-field approach to learning, suggests that learning is not merely a passive experience of behaviour which can be elicited by a stimulus and strengthened or weakened by reinforcement, but an active process in which the learner infers principles and rules and tests them out. Learning in this case is not just something which happens to the individual but something which the individual takes an active part in and makes happen by the manner in which he or she copes with incoming information and puts it to use (Bryant, 1982). Bruner (1966) argues that the behaviourists pay insufficient attention to the elements (below) that interferes with the learner's behaviour. He suggests that for an individual to learn, he or she must interpret the learning experience within their own terms of reference and are thus not merely reactive to stimulus. Fontana (1983) refers to an explanation by Bruner:

'This behaviour is not simply something brought about by a stimulus and strengthened or discouraged by reinforcement but ... is a complex activity which involves three major processes, namely:

- *the acquisition of information;*
- *the manipulation or transformation of this information in to a form suitable for dealing with the task in hand;*
- *testing and checking the adequacy of this transformation' (ibid. :150)*

The important distinction between these two schools of thought is that whereas Skinner refers to the stimulus as a discrete event, that is distinct from other events and induces a mechanistic response from the learner, Bruner sees it as something that is identified and recognised by the learner in his own subjective way, i.e. the stimulus or training event is personalised by the trainee and is transformed through his or her previous experiences and thoughts. Bruner argues that the learner reacts in a far from purely mechanical way and that it is easy for the learner to ignore the stimulus altogether. This explanation of the learning process advances from that of modifying behaviour to one of increasing the opportunity for learners to modify their performance, i.e. choice and selectivity are available to the learner.

The way in which Bruner interprets the transformation of incoming information by the learner is important. He believes this transformation is linked to a representation of past experiences in the memory which are used to deal with the present. The adult learner is capable of using three systems acquired in childhood. Bruner, Goodnow and Austin (1965) label these as the enactive, the iconic and the symbolic.

- The enactive is a highly manipulative mode. It uses neither imagery nor words and operates through action e.g. motor skills, which are learnt by doing and are difficult to represent through language or pictures.
- The iconic mode is more developed in that it does use imagery but it still does not employ language. This imagery depends upon visual or other sensory organisation, for example our mental pictures of routes from one point to another, yet it is often difficult to translate this into language and give directions to others.
- The symbolic mode employs representation through language. This leads to learning of a much more flexible and abstract kind, allowing reflective thinking and for the individual to consider propositions as well as concrete examples. The symbolic mode would also support the use of other modes than just language, such as those used in mathematical and scientific logic. Bruner (1966) argues that Skinner's operant conditioning model could be an appropriate description of the way learning takes place where the learner is operating in the enactive mode, but it gives little information about the iconic or symbolic modes. For the educational technologist it is likely that both these views can contribute to the planning and evaluation of learning experiences in different forms.

Explanations of learning from psychology make a useful contribution to understanding evaluative structures for individual performance. Evaluation from the behaviourist view can structure assessments of learning in two forms:

- evaluating the management of reinforcement opportunities within the learning experience;
- evaluation of the behavioural changes of the trainee during and or as a result of the learning experience.

This traditional way of testing before and after learning is common in many training texts. Evaluation of Bruner's learning attributes; enactive, iconic and symbolic modes, are more difficult. For learning experiences based in organisations the development of appropriate evaluation methodologies are often lacking. Goldstein (1980) notes in his review of the literature related to training in psychology:

'The literature on machine simulations and behavioural role modelling constitutes almost the entire empirical literature on simulation techniques in work organisations. McGehee & Thayer in 1961 and Campbell in 1971 decried the lack of empirical studies investigating other types of simulation including the case study, business games, and basic role playing procedures. Unfortunately, their concerns are still valid today, and information concerning the utility of these techniques for achieving various behavioural outcomes remains a mystery.' (op. cit. :258-9)

Clearly the complexity of theoretical structure can force the design of training into the assessment of behavioural outcomes as an indicator of learning from simulation techniques. While this may prove useful in a number of circumstances it ignores the assessment of conceptual change which is a central interpretative element from learning. By disregarding the range of learning modes, Bruner would argue that the breadth of formative experience relevant to learning is not being measured.

Therefore a useful approach would be to consider the training function from a 'closed perspective' and look at the performance of existing evaluative indicators used to assess the value of investment in training. This poses the question of the extent to which training, as a formal procedure for knowledge acquisition, adds value over the cost of providing it. If the answer to this question cannot be determined then the process by which the benefits from a firm's investment in training and learning are evaluated must be explored within a wider framework.

Latham (1988) discusses the comparative contributions from psychology and economics on training evaluation. He argues they have diverged to recognise on the one hand the characteristics of individual learning behaviours, and, on the other, the influence of the external environment and the manner in which this dictates training needs via operational requirements and financial opportunities.

Current approaches to evaluating the effectiveness of learning technologies have their origins in behavioural psychology and economics, Figure 2.2, and despite their diverse disciplinary origins they both represent a common concern about providing useful information about the value of training provision. This also provides an example of the value of different perspectives when investigating complex socio-technical issues.

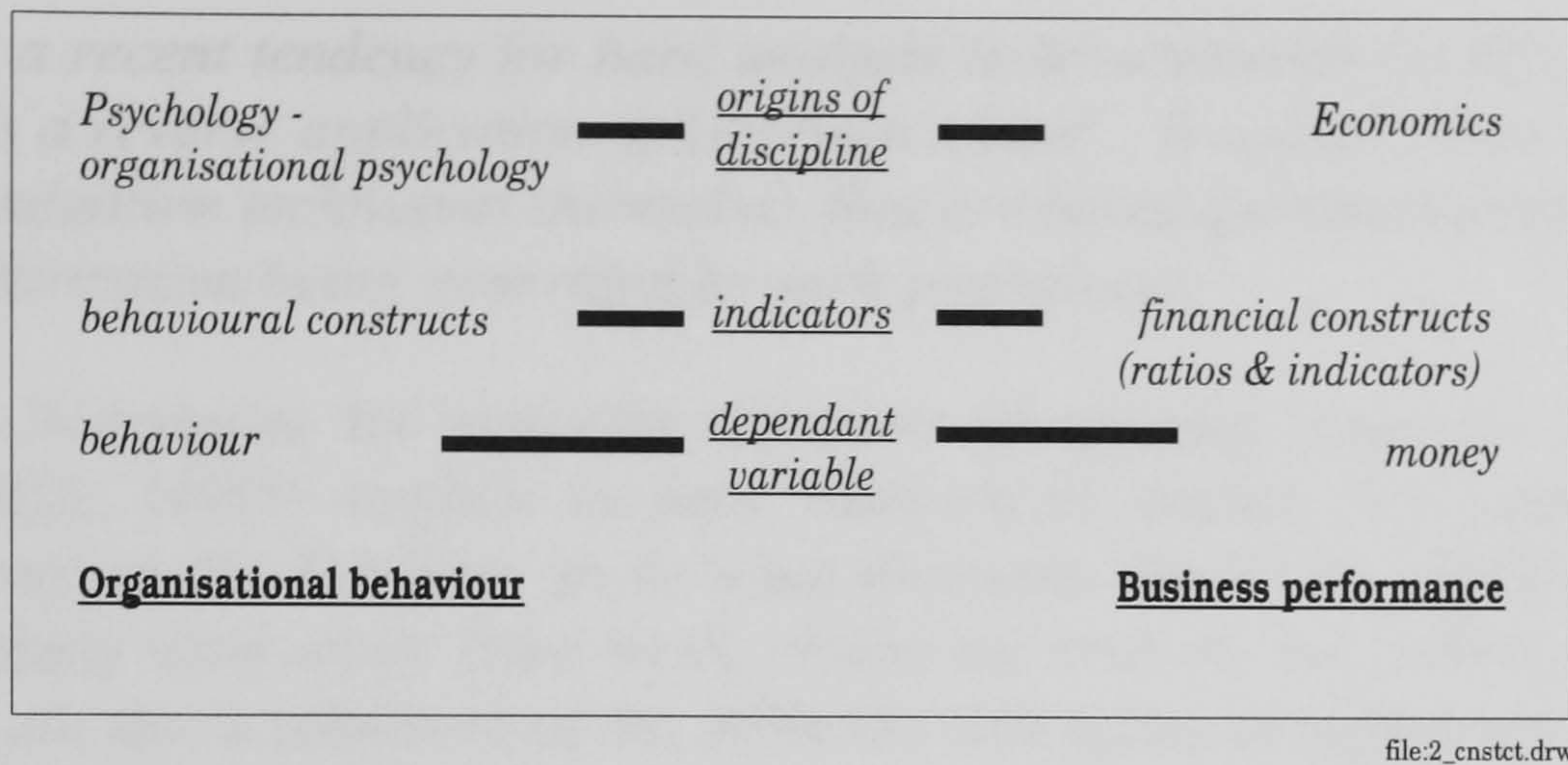


Figure 2.2 Evaluative constructs

2.1.2 Evaluating training investment

The costing of training in economic terms is equally problematic as that of adopting behavioural indicators for assessment. Unlike the behavioural criteria which are derived from organisational psychology monetary 'value' is based on financial constructs. Economic evaluations of benefits from training include three main approaches: the valuation of comparative training costs using different delivery or teaching methods, the opportunity costs of not training and the assessment of the benefits from training in terms of input to the organisation. As noted in 2.1.1, the limitation of applying economic evaluation criteria to the provision of formal learning is that it is a single perspective measure. It is based on the assumption that improvements in learning performance can be equated with improved organisational performance. From this assumption performance assessments are then judged either by direct or indirect comparisons of cost.

Similar evaluation problems exist in the field of information technology where the resourcing costs constitute a major investment decision for an organisation. Here Powell (1992) notes the difficulties of assessing value for the organisation as,

'All investment decisions are problematic. The IT community seems to shy away from evaluation of its investments ... because the costs and benefits are hard to identify and quantify and the intangible factors present are likely to be significant.' (ibid. :29)

He catalogues a number of objective evaluation methods for IT including: cost-benefit analysis (Lay, 1985), utilisation techniques (Martin and Trumbly, 1986), value analysis (Keen, 1981), decision analysis (Schell, 1986) and others, as well as subjective evaluation methods such as user attitude surveys, potential problem analysis, event logging, Delphi evidence, anecdotal evidence and systems analysis. He notes that in the past there has been a tendency for 'soft measures' to be driven out by quantitative techniques. Yet it is interesting that Ijiri (1975) comments:

'there is a recent tendency for hard analysis to be overtaken by soft, he refers to this as a reverse application of Gresham's Law¹. It appears that it may not be the evaluation techniques themselves that are being questioned but the value of the information being generated by such procedures.'

Defining the boundaries for assessing the costs of training resources is not easy as Talbot and Ellis (1969) explain in their analyses of costing for company training. Guidelines vary in the literature as to what elements should be allocated to training costs, particularly time away from work versus the cost of not training staff. These observations are also a reflection of the difficulty that exists in separating the role of the individual from their contribution to the organisation. As the complexity of an individual's job function increases it becomes more difficult to identify and value the variety of training experiences required. In such cases the result of this evaluation may be of limited value to the organisation. Of greater concern to the organisation must be how to establish internal mechanisms that enhance what is learnt in such a way as to contribute to 'performance' in some form.

2.2 Systems approaches to training

Hays (1992) uses the term 'systems approach to training' (SAT) to describe the objective for training to enhance the performance of the wider organisation. This enhancement of the '*suprasystem*', he argues, arises from enhancing the performance of individuals through learning, i.e. the trainee performing tasks more effectively.

The origins of instructional system development (ISD) can be traced from the war years where the procedures were implemented using a systems approach to training. This was the result of a conceptual understanding of learning the correct application of the problem solving approach developed within systems analysis. This features three main elements:

1. *it uses an interdisciplinary team of experts to bring as much relevant information to a problem as possible;*
2. *it uses 'models' or simplifications to reduce complex problems to analysable proportions; and*
3. *it uses systematic, yet dynamic problem solving methods that can be modified by the team of experts at any point during the analysis to better handle the specific problem. (ibid. :260)*

The adaptive use of systems analysis for training originated from an ISD process which uses a cybernetic paradigm, i.e. the theory of communication and control and which emphasises information transfer and feedback. This came to be known as the systems approach to training (SAT). Training methods and models were designed and modified by a team of decision makers (experts within specific disciplines) to ensure that the

¹Gresham's Law, tendency for money of lower intrinsic value to circulate more freely than money of higher intrinsic and equal nominal value - from Sir T. Gresham, English financier d.1579.

models were appropriately applied. A significant shift occurred in the 1960's when it was believed that the performance of these SATs could be achieved by taking the methods and models used by the program experts and then handing them over to the 'layman' to be applied at a lower cost. The methods and models were adapted as sequences of procedures which divided the training program into single steps of specific tasks and objectives for behavioural performance, and criterion tests for programme evaluation. The translation of SATs into proceduralised manuals abandoned the key elements outlined above (Hays, 1992) that were critical to the performance of systems analysis. Whilst the name of SAT remained, along with some of its products and terminology, these modifications were detrimental to its performance. It was not until later in the 1970s that it became clear from the available theory and empirical evidence on learning performance that such proceduralisation was ineffective, yet the expectations remained that SAT could and should work. When this modified version failed it was argued that SAT was not an effective means by which to design training programmes. It is for this reason that Hays (*ibid.*) argues that by appreciating and understanding the systemic nature of training value will be gained by a return to more flexible learning methods. By understanding the origins of the SAT training developers may become aware of the many factors that potentially influence the behaviour of an organisation intended to benefit from training.

A training system is composed of people, materials and techniques, requires the performance objectives or goals of human performance to be in agreement with the criteria for that particular sub-system and its relationship with the wider organisational environment. As observed in the complexity of biological systems, each group of individuals will have their own characteristic functions, materials or techniques and may have their own subsystems and sub-subsystems. In particular it is the goals of other groups of individuals which may conflict with the training system development and others formulating this planned interaction. It is common for factors outside the training system to dictate the direction and nature of the training or learning experience.

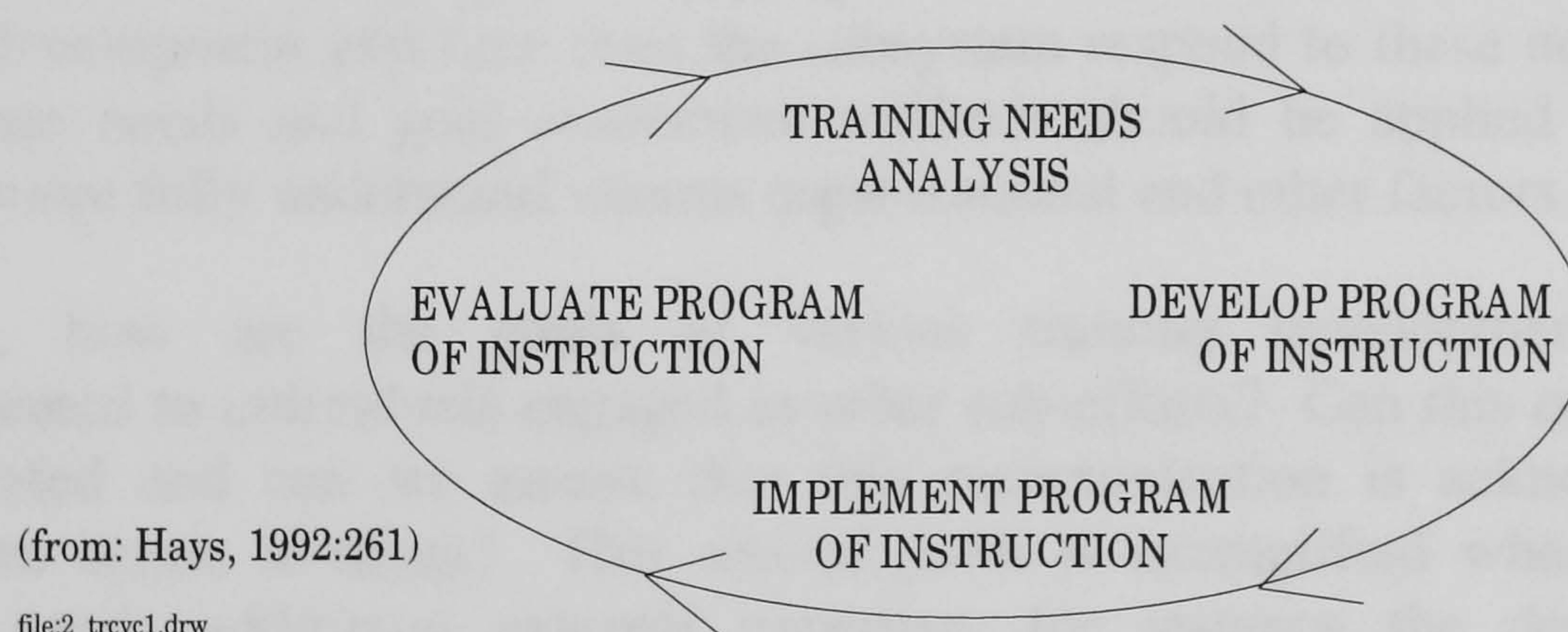


Figure 2.3 The training system development cycle

2.2.1 Skills training and the capacity for change

Once a training system is developed and the structure established, how should it be improved? It was noted earlier that training systems are a cyclic, iterative process with the major goal being to improve the performance of the organisation by improving the trainee's performance, i.e. the specification of measures of individual performance to

meet organisational goals. Hays refers to a methodology for systems improvement with the following sequence:

1. *The problem is defined and the system and component subsystems are identified.*
2. *The actual states, conditions, or behaviours of the systems are determined by observation.*
3. *The actual and expected conditions of the system are compared in order to determine the extent of deviation.*
4. *The reasons for this deviation are hypothesised within the confines of the component subsystems.*
5. *Conclusions are drawn from the known facts by a process of deduction and the large problem is broken down into sub-problems by a process of reduction. (Hays, 1992:263)*

Such an improvement process requires a good understanding of the systems' problems and in turn requires an understanding of its goals and expected conditions. The use of this methodology underlines the need for training developers to understand these goals and not only the goal of the whole system, but of all the sub and suprasystems. If this information is obtainable then it is reasonable to follow such a methodology. However, if the wrong goals are identified changes may lead to solutions that are worse than the original problems they were intended to overcome. The use of a systems approach may result in the recognition that the goals of a single system can conflict with those at other system levels. Hays (1992) argues that this possible conflict necessitates knowledge of the differing objectives at each level of training. Therefore it is essential to focus on the mechanisms of communicating between training system levels I. e. how is the training curriculum communicated? He identifies two important research questions which arise from this:

- How are the needs and goals of a suprasystem communicated to the subsystem for training development and how does the subsystem respond to these needs or goals? Appropriate needs and goal assessment methods should be applied at all system levels to more fully understand various organisational and other factors.
- Secondly, how are the goals of various training development sub-efforts communicated to individuals engaged in other sub-efforts? Can this communication be facilitated and can we ensure that this communication is acknowledged and appropriate action is taken? This second point is exemplified when the training function needs additional external expertise, for instance the development of technology based training delivery.

'The communication channels between system levels need to be identified and examined to ensure optimal information exchange and training policy development.' (op cit. :263)

The communication of knowledge requirements between system levels is important, both in terms of the specification of training and in the acceptance of training needs. In

order to understand organisational responses to training, integration of the learning elements are considered as a systemic process in the following chapter.

Biggs (1993) contributes a useful insight into the value of adopting different forms of learning approach to differing types of knowledge requirement. In particular he challenges the frequent dismissal of certain modes, or approaches, to learning as being less important than others. He notes in his theoretical critique of inventories of student learning processes:

'Both terms 'deep' and 'surface' are used generically; what they specifically mean in any instance depends on the context, the task, and the individual's encoding of both. Thus a decision to 'satisfice', to reproduce without understanding, could well implicate rote learning. But a decision to ensure accurate recall of already understood information, say for a high stress situation such as an examination or an interview, or for learning lines in a play, may also implicate rote learning. The first is an approach, the second is not; indeed, the latter should, depending on context, be part of a deep or an achieving approach....To complicate matters further, Chinese and Japanese believe that understanding may come through memorisation, and as the intention here is to deepen understanding, a memorisation strategy in this case becomes part of a deep approach' (ibid. :7)

Clearly there are no direct mechanisms for evaluating the effectiveness or existence of 'organisational learning' behaviour (Levitt and March, 1988). The research that prefers to consider that organisations behave with the characteristics of individuals, with their own intellect, resort to economic or productivity measures of change. Frequently this approach fails to apply the evaluative mechanisms available from other disciplines which can contribute to the assessment of individual performance.

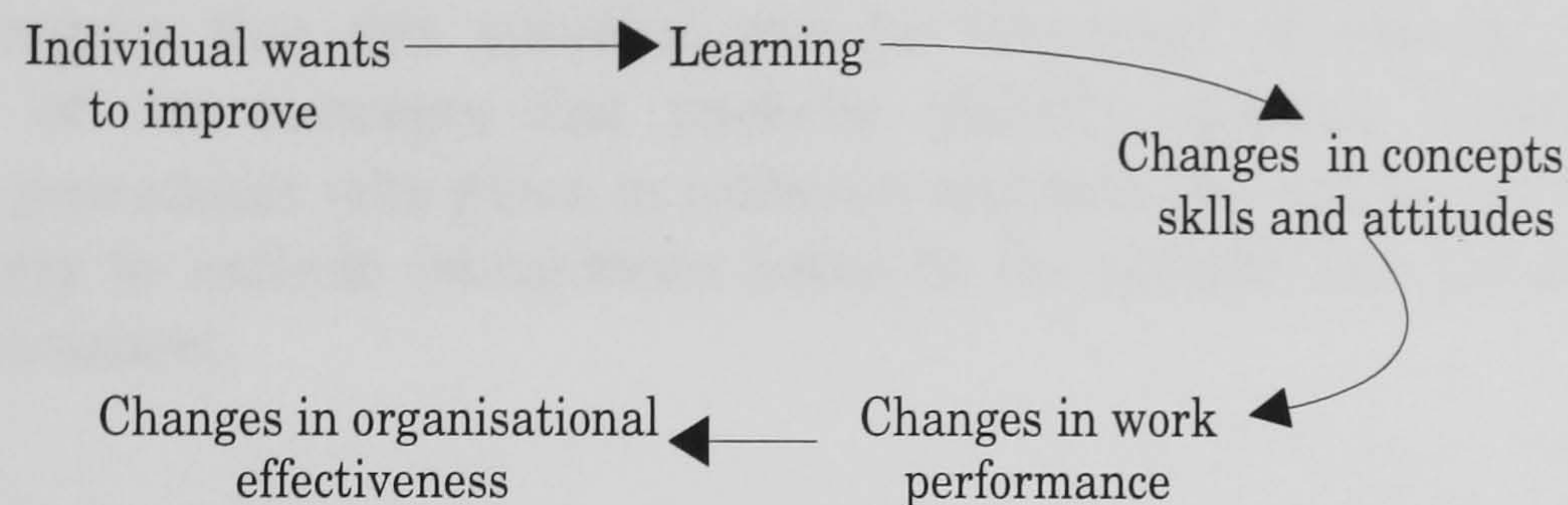
So it is of interest in this thesis to consider which fields of study recognise the value of knowledge in an organisational context, how such literature provides models of organisational learning and whether or not it is possible to contribute insights from this work in the context of training.

2.3 Models for the curriculum of learning provision in organisations

A number of authors (Galbraith, 1974; Levine, 1988; Schumacher, 1988) refer to the term 'training transfer' in recognition that training may take place, with the trainee demonstrating learning during tuition, only to find this learning is not translated into assimilation in the workplace (Trott, Cordey-Hayes & Seaton, 1995). This issue, whilst outside the boundary of many learning environments, is of importance when benefits to the organisation are to be evaluated.

Bramley (1989) proposes a model of organisational change evolving out of individual learning processes that have their origins in education (Figure 2.4) and summarises the education model as a starting point for many training models. An understanding of the origins of educating the individual are central to changing the capacity of people to

contribute to change in the work place. However Bramley criticises focusing on changes that occur from individuals as being unable to overcome contextual factors without accommodation from the organisation.



from Bramley (1989)

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Figure 2.4 Individual training model

This offers a challenge to models of training which are based on the principles of education and complicates the debate about how learning in organisations should successfully take place, i.e. should learning efforts be concerned about adequate learning provision or adaptation of organisational structures?

It is important to recognise that whilst using the education of the individual as a model of training, early texts have debated the purposes of education and learning, and placed these within a clear societal context. Writers such as Tyler (1949) argue that the curriculum planning model has four dimensions: objectives, content or subject matter, methods or procedures, and evaluation, and he suggests that there are four fundamental questions which must be answered in developing any curriculum and plan of instruction:

1. *What educational purposes should be sought?*
2. *What educational experiences can be provided that are likely to attain these purposes?*
3. *How can these educational experiences be effectively organised?*
4. *How can we determine whether these purposes are being attained (Tyler, 1949:1)*

Kelly (1982) in his discussion of the school curriculum considers the linearity of this model with respect to changes in society and the demands made upon education by the sponsors and beneficiaries of schooling. More recently an increased focus has been placed on education and the context in which it contributes. The 'debate' concerns who should benefit from these experiences. However, unlike training, schooling recognises the principle of individual development over the longer term. Indeed the distinction between education and training must be seen in the vocational directions upon which each element of learning is based. Thus in the educational context it can be accepted that the focus of learning is in the development of the individual and the development of a capacity with which to continue learning. It could be argued that for many organisations this principle of supporting 'learning to learn' should be a central objective.

Examples of this contextual problem have been evident with the need to integrate educational media into co-ordinated instruction. Here training developers, administrators and product designers have often worked in isolation without recognition of the influences upon the performance requirements associated with their products. Hays (1992) argues that this situation can be improved if managers gain a fuller understanding of the concepts that underlie training systems development. Few organisational procedures take place in isolation and thus the influences upon a working system are likely to include interactions between the people and resources within the operating environment.

2.4 Summary

There is clearly a demand for a model of learning which is different from that which has its origins in education. The evaluation boundary must be extended to include the performance within the organisation. Similarly the origins and evaluation of learning provision must include references to wider organisational structures and the stated requirements for knowledge acquisition on behalf of the organisation. Such a model would include the definition of desirable attributes that enhance effectiveness. These attributes could then be translated into learning outcomes determining the skill and resource requirements necessary for providing learning experience to be assimilated into the organisation. The model of 'increased effectiveness' (Bramley, 1989) emphasises the benefits of training designed to prepare staff not only for the technical requirements of a job, but also the social context in which they find themselves. Where tasks require a significant human-centred focus for efficient or safe operation the training provision commonly reflects this; for example the operational demands of the fire service routinely requires effective team working both on and away from incidents.

Such a model would relate learning requirements to the training experience and then to the assessment of learning outcomes. It would include a specification by the organisation of its knowledge needs and relates the performance of an individual closely to the expected performance of the organisation itself. However it does not address the question of organisational adaptation from learning as it relies on the specification of knowledge from known requirements. The model is therefore determined by a system of experience referencing know past, current or future needs as opposed to being adaptive. The difficulties in looking at organisational adaptation have been investigated in research focusing on technological change. Here the evolution and utilisation of technology is linked to the processes of learning in organisations and organisational response to acquired knowledge. Research focused on the process of innovation is considered further in following chapter.

CHAPTER 3

3. Models of the process of knowledge transfer from individuals to the organisation

3.1 Introduction

This chapter draws upon two paths of the research literature focusing on the management of 'knowledge acquisition' in organisations. The critique is structured through two themes; knowledge transfer in the field of technology transfer and the different perspectives on the exploitation of knowledge. from organisational development.

The approach to using models of cumulative knowledge in this thesis lies in the development of interdisciplinary research into technology assessment, technology policy and innovation at the Innovation and Technology Assessment Unit (INTA) at Cranfield University. The approach emphasises the use of such systems concepts as process, interaction, and complexity and a wide range of qualitative and quantitative techniques from social science and sociology. More recently aspects of the research have been influenced by thinking in complex systems and evolutionary theory. Such an approach is distinctly different from the majority of current management research in its origins in technology and systems thinking and its emphasis on enquiry with individuals in organisations. Although it deals with organisations, it makes no claim to be part of the conventional ethos of organisational theory. There is, however, useful overlap with those parts of management research that focus on the notions of dynamics and process, that are either systemic or sociological in style or that deal with organisational learning and the capacity for change.

The first set of research projects was concerned with the issue of technology transfer at a time when there was considerable concern about the poor rate of technical innovation in British Industry. Four projects are described in Seaton and Cordey-Hayes (1993). In this paper technology transfer is redefined in process terms as:

"The process of promoting technical innovation through the transfer of ideas, knowledge, devices and artefacts from leading edge companies, R&D organisations and academic research to more general and effective application in industry and commerce" [this has been considered in its widest sense as] "knowledge transfer".

Thus technology is seen in terms of types of knowledge about the man-made world and as much about organisation, processes, procedures and people as about physical objects. "Knowledge" is treated as a human attribute to distinguish it from information and data and is seen as the capacity to do things in the sense of "know how...". Any further research will have to consider the different types of knowledge and the way in which different fields of research classify them.

The outcome of this early research was the further development of the idea of technology transfer as an interactive process in which people are the key agents. In particular it was found useful to make a distinction between the following processes

Accessibility: making available and disseminating information about engineering products and processes

Mobility: the channels by which technology/knowledge is actually obtained

Receptivity: the ability of organisations to relate to and act effectively on this knowledge

This gives rise to the so-called AMR model and in turn to much greater emphasis on research into Receptivity. It is analogous to the notion of "absorptive capacity" developed by Cohen and Levinthal(1990) in the context of internal R&D knowledge transfer. However the next issue is how receptivity is to be recognised within organisations. The second phase of the programme therefore was to investigate within organisations the process of knowledge acquisition and use. One important project took place within ICI over a two year period with considerable co-operation of senior managers and staff. This work is reported in Trott, Cordey-Hayes and Seaton (1995).

A conceptual model is developed which identifies four major components of the inward technology transfer process. These are "awareness", "association", "assimilation" and "application". Using this conceptual device, a series of studies were conducted within ICI Chemicals and Polymers.

The conclusions indicate the importance of non-routine and effective communications between credible boundary spanning individuals. These are key aspects of the assimilation of new knowledge and the inward technology transfer process. This requires successful organisations not only to be efficient and competitive at their routine business in order to survive in the short term, but also to make room for opportunities for these creative, non-routine assimilation processes, which are stochastic in nature, if they are to remain competitive in the long term"

In parallel with this project further research was being undertaken into aspects of receptivity by Craig (1994), Hinton (1995) and Gilbert (1995). The work by Gilbert is distinctive in that the main imperative for organisational change in the case-study organisation, Lloyds Private Banking, was not technical change but market driven. It therefore develops the ideas of learning in organisations in a way that enables knowledge acquisition and change to be more widely generalised. Where this research as focused on organisational learning greater use has been made of the work by Cohen and Levinthal (1990) as a starting point. This work is sufficiently significant for it to provide one of the main conceptual contributions to this thesis.

Sections 3.2 and 3.3 begin from a similar premise. Training evaluation is primarily concerned with the provision of knowledge for the benefit of the organisation. This tends to exclude concerns with personal development and as such is a form of labour

management. In the light of this it would seem helpful to focus on literature that is concerned directly with the mechanisms by which organisations can exploit knowledge and expertise. Here the term ‘exploit’ refers to attributes that are currently, or will be beneficial to the organisation. The consideration of potential benefits will be returned to later.

Studies in technology transfer offer useful insights into the central issues of knowledge exploitation that concern this research. Also of interest are the means by which organisations exploit new forms of knowledge. Two research areas offer analogies for studying the benefits of training in this context. These are, firstly the means by which organisations function to exploit or accumulate this new knowledge, and secondly the analysis of mechanisms of external and internal knowledge transfer in organisations. It is proposed that by considering literature on the ‘technical functions’ (Adler, 1992) in organisations that manage knowledge a useful parallel can be made with the role of training. Further it is appropriate to consider recent areas of research into internal processes within these technical functions of organisations. Early studies of technology transfer focus on the outcomes of knowledge acquisition without offering insights into the internal processes of knowledge exploitation. Therefore this Chapter concludes by relating research on the internal processes of knowledge exploitation in organisations to training and knowledge acquisition. It begins with a view of the mechanisms by which organisations function in order to exploit new technological knowledge, or use internal, technological, cumulative knowledge. Studies of technology transfer and the parallels that exist between this research and training issues are then explored. The Chapter concludes by drawing ideas from studies of knowledge assimilation in the technology adaptation process.

3.2 How organisations exploit knowledge

This section uses two routes in the literature to consider the issues of knowledge management by organisations. These two interpretations focus on the mechanisms by which organisations exploit technological and technical knowledge; one with its analysis focused on economic interpretation, and the other from a sociological perspective.

The paper by Cohen & Levinthal (1990) on ‘Absorptive capacity: a new perspective on learning and innovation in organisations’ uses the term ‘absorptive capacity’ to define a firm's capability to use knowledge. It sets out to explain how organisations...

‘recognise the value of new, external information, assimilate it, and apply it to commercial ends...’(ibid. :128)

This process of ‘absorbing’ knowledge is, they suggest, critical to a firm's ability to innovate. They relate identify the way in which individuals learn and their background or ‘prior experience’ of learning and ‘learning to learn’ contribute at the organisational level. This analogy to cognitive processes structures their interpretation of the use of knowledge and emphasises the necessity for an organisation to develop expertise in learning. In broad terms their paper considers the learning behaviour in an organisation

to be similar to that of an individual. This is then analysed using economic indicators to represent successful use of knowledge. In their words they,

'characterise..., how an organisation's absorptive capacity differs from that of its individual members,...'(op. cit. :128)

By focusing on the requirements for individuals to develop expertise in learning and thereby to benefit from new knowledge, attention is drawn to the 'learning to learn' literature that has emerged from the education debate over the value of differing learning experiences (Biggs, 1993). The wider education debate focuses on the extent to which a variety of learning experiences can offer valuable tuition for the individual in achieving learning skills. Here Cohen and Levinthal (1990) draw attention to an organisation's previous history as a significant determinant in its ability to use new knowledge. The authors recognise that the factors concerned with the enhancement and survival of innovation processes and suggest that outside sources of knowledge, whether embodied in 'hard' or 'soft' technologies, are central to a firm's development.

Other authors have also used the analogy of organisations 'learning', indeed Willman (1991) emphasises the need for organisations to develop capability in learning for their own competitive survival. He notes:

'... that firms are differentially capable of locating and appropriating their own knowledge bases, and that this differential capability relates to their innovative capacity. Put briefly, the organisational capacity to implement and appropriate new technology is the key to success,...'(ibid. :2)

Some similarity exists between the study of new external information and the application of knowledge. This process of knowledge use can be seen to have similarities with the process of using knowledge from the training function. Here the value of provision of new knowledge to the trainee is dependent upon use, or usefulness, in their job. In the innovation context, knowledge is critical to this process of change, and studies of organisations have used innovation indicators, such as the number of new technologies adopted, as evidence of this learning. Cohen and Levinthal (1990) recognise similarities with the training function when they note,

'Firms also invest in absorptive capacity directly, as when they send personnel for advanced technical training.'(ibid. :129)

Technical training and investment in R&D knowledge have similar characteristics (Adler, 1992) which raise questions about the value of knowledge in an organisation and the mechanisms which enable this knowledge to be exploited. Cohen and Levinthal (1990) offer an explanation of the process by which an organisation uses knowledge by using the analogy of what is known about individual learning. Here,

'Research on memory development suggests that accumulated prior knowledge increase both the ability to put new knowledge into memory, what we would refer to as the acquisition of knowledge, and the ability to recall and use it.' (ibid.)

Similarities with training and education are evident where institutional and curriculum structures exist to develop and enhance the learning of individuals by sequencing learning so as to acquiring primary skills in early education. These skills are subsequently be applied in the development of higher order skills both in learning and in the use of knowledge. A familiar example is the emphasis placed on the three 'R's in schooling where it is argued that little further progress in learning can be made until competencies in these three areas have been achieved (Kelly, 1982). Whilst an important debate exists in education as to how one should deliver these experiences, few would argue against the centrality of these skills. There is certainly logic in acquiring the skills of learning through developmental learning experiences. A further example of this would be in gaining expertise in algebra before attempting to use calculus. Such logic remains even if the acceptability of such learning is open to question by the individual. Knowledge may of course often be acquired with no further consequence for use and this is demonstrated by individuals just as commonly as organisations. Cohen and Levinthal (1990) suggest that...

'knowledge may be nominally acquired but not well utilised subsequently because the individual did not already possess the appropriate contextual knowledge necessary to make new knowledge fully intelligible.'(*op. cit.* :129)

The distinction between abstract and contextual knowledge is useful in drawing attention to the circumstances in which individuals and organisations focus their expertise. The cognitive structures which enhance the acquisition of new knowledge are routinely associated with familiarity or utility and necessity in daily life. Both of these structures for acquiring knowledge operate within a context of other interests or broader needs. For many organisations highly focused R&D knowledge is inappropriate and lost, yet for others it plays an interesting and relevant role in a pattern of contextual knowledge.

Cohen's and Levinthal's (1990) explanation of absorptive capacity in organisations refers to the mechanisms by which learning may take place, here,

'implicit in the notion that the ability to assimilate information is a function of the richness of the pre-existing knowledge structure: learning is cumulative, and learning performance is greatest when the object of learning is related to what is already known.'(*op. cit.* :131)

Emphasis at this stage is placed on the cumulative nature of learning, and the importance of the association of learning experiences with existing knowledge. This reference to pre-existing structure in knowledge assimilation is interesting not only from the studies of individual learning, but in studies that consider the structure of an organisation and its ability to acquire knowledge. The argument that learning is 'cumulative' brings attention to the expertise that is gained both by the individual and apparently in organisations from learning how to learn. The term learning 'how to learn' is a representation of collective expertise for the individual or organisation. One important element is the selectivity with which learners apply cognitive structure to information that is available to them. The idea that learning performance is greater when the object of learning is related to what is already known places emphasis on this

element of familiarity and background in 'learning how to learn' i.e. the selectivity and recognition of relevance for particular types of information. In the case of individual learning the relationship between learning to 'what is already known' is reflected comprehensively in the psychology discipline. A number of studies have been concerned with changes in learning performance when the relevance of what is taught is recognised by the individual from their associations with existing experience.

Clearly caution should be observed when using a model of individual learning to explain how an organisation might gain expertise to exploit knowledge. As with most analogies, limitations exist, and as Cohen and Levinthal explain...

'A firm's absorptive capacity is not, however, simply the sum of the absorptive capacities of its employees, and it is therefore useful to consider what aspects of absorptive capacity are distinctly organisational.' (Cohen & Levinthal :131)

The illustration of 'learning how to learn' infers an accommodation and adjustment to learning experiences by the individual. This process can only be represented in an organisation by changes in organisational structure and boundaries. The attributes within an organisation that influence knowledge acquisition and retention are normally determined through the organisation's accountability and control mechanisms i.e. its management structure. These are internal processes and it is inadequate to assume that if an organisation is appropriately exposed to relevant knowledge which is referenced to an existing domain of experience then it will be able to fully exploit the benefits from that knowledge. Knowledge often requires internal transfer and adjustment if it is to be adequately acquired. This dependency on internal mechanisms alongside the external exposure to knowledge provide important parallels with training. Their explanation that...

'...absorptive capacity does not only depend on the organisation's direct interface with the external environment. It also depends on transfers of knowledge across and within sub-units that may be quite removed from the original point of entry.' (ibid. :132)

In training, the frequency of an individual's 'exposure' to knowledge does not correlate directly with the internal use of this knowledge in the organisation. The comparative failure of training in many circumstances is often due to wider effects than a failure of the trainee to be exposed to adequate knowledge. The organisation faces many challenges in applying the knowledge acquired from external sources and these are paralleled by the difficulties that an individual often experiences in using knowledge acquired from training. Sometimes this is due to organisational structures or the inappropriate nature of the knowledge itself. In other circumstances unsupportive work contexts prevent the utilisation of relevant learning. These unchanging contexts may even be, in the case of organisations, the result of earlier successful knowledge use resulting in an unwillingness to change.

'Critical knowledge does not simply include substantive, technical knowledge, it also includes awareness of where useful complementary expertise resides within and outside the organisation' (op. cit. :133)

The facilitative nature of supporting knowledge can sometimes determine the successful exploitation of ideas. Experiences are common where single, apparently minor technical details appear to determine the successful outcome of larger projects. The managerial implications for identifying complementary expertise are evident in many organisations. It is also possible to recognise this characteristic in training where the individual learner often requires tutorial guidance or managerial support to exploit new knowledge. From their studies of technological development of R&D in the US telecommunications sector, Cohen and Levinthal (1990) suggest

'a simple generalisation that applies at both the individual and organisation levels: prior knowledge permits the assimilation and exploitation of new knowledge. Some portion of that prior knowledge should be very closely related to the new knowledge to facilitate assimilation.'(op. cit. :135)

Following their argument in the context of training, knowledge is exploited when it is founded on prior exploitation or use in the organisation, and some part of this new exploitable knowledge is related directly to previous operations. Commonly the objectives training (SAT, Chapter 2) would suggest that it is of interest to know to what extent knowledge can be related to the organisational context and to what extent the work-place context enhances the exploitation of training.

The motivation to learn is clearly an important concern both for the trainee and for those concerned with knowledge acquisition in the firm. The authors suggest that...

'There are two factors that will affect a firm's incentives to learn, and, therefore, its incentives to invest in absorptive capacity.... First, there is the quantity of knowledge to be assimilated and exploited: the more there is the greater the incentive. Second, there is the difficulty for (or conversely, the ease) of learning. Some types of information are more difficult to assimilate and use than others.'(op. cit. :139)

The ready availability and ease of knowledge acquisition are favourable conditions under which an organisation may benefit from learning. It would seem reasonable to suggest that the ease with which knowledge can be turned into know-how and the availability of such knowledge would increase the success in exploiting learning. The cognitive metaphor of learning organisations is readily translated to the training context where the availability of 'good quality' training and the ease of learning can be proven to enhance the recall of this knowledge by individuals. However, the concern remains in both cases that whilst this knowledge may be acquired and thus available for exploitation these factors do not ensure its ultimate exploitation for the benefit of the organisation. What they do is enhance the likelihood or potential of such an occurrence. They are therefore an enhancement in 'capacity' or potential and not true outcomes or performance.

From this position Cohen and Levinthal (1990) then suggest a research method by which to analyse the framework of absorptive capacity.

'To test the predictions of our framework for R&D activity we used cross-sectional survey data on technological opportunity and appropriability conditions in American manufacturing sector...'(op. cit. :142)

A possible contradiction in the cognitive analogy arises here with their use of survey data, an external performance indicator, to consider the framework of absorptive capacity. The authors set aside their interpretation of capacity as an internalised potential and use data on technological opportunity and appropriability conditions in the US to illustrate the framework. This shift in their approach is from internal processes in the organisation to external measures. It is argued in this thesis that difficulties arise with attempts to draw direct relationships between an internalised capacity such as the acquisition of knowledge and the observation of its exploitation in organisations or by individuals. In the training context the evaluative constructs discussed in Chapter 2 which offer economic or quantitative indicators of learning e.g. pre- & post-test measures, as proof of training present similar difficulties. Such measures may well be indicators of success but relative failure does not necessarily imply a failure in the training function or learning of individuals. The use of these indicators to determine areas of failure is unhelpful as they do not uncover the nature of the knowledge exploitation process. Cohen's and Levinthal do not address this issue. They conclude:

'In terms of our discussion of the cognitive and organisational aspects of absorptive capacity, we may think of basic research as broadening the firm's knowledge base to create critical overlap with new knowledge and providing it with deeper understanding that is useful for exploiting new technical developments that build on rapidly advancing science and technology.'(op. cit. :148)

Their emphasis is placed on organisations gaining the potential to acquire knowledge, yet the analytical indicators used and the assumption drawn above imply that the exploitation of knowledge is an inevitable consequence. Certainly this cannot be supported in many examples of technology transfer or training. Suggestions lie in their subsequent observation which...

'... suggests that an innovation that is fully incorporated in capital equipment will diffuse more rapidly than more disembodied innovations that require some complementary expertise on the part of potential users. This is one of the anticipated benefits of making computers more 'user friendly'.'(op. cit. :149)

Elements of this argument certainly exist where organisations are able to absorb new technologies embodied in 'hardware' more easily than softer technological knowledge. However they can not be directly assumed to be attributable to a lack of 'complementary expertise on the part of potential users' in all cases. The mechanisms that are necessary to exploit knowledge in an organisation are not always properly focused. The provision of technology in a physical form frequently demands restructuring that is both obvious and easy to identify and may occur regardless of complementary expertise. In the case of training we know similar examples to be true. If an organisation requires individuals to perform skills using new technology the likelihood of benefits from this learning are significantly increased if 'situational' changes occur that encourage and enable the

trainee to exploit their learning. By understanding better the mechanisms for the transfer of exploitable knowledge to the work-place the chances of success are greatly enhanced. It is clear that this understanding of the elements of internal process cannot be uncovered by the analysis of variance from external indicators of the organisation.

Cohen & Levinthal's (1990) ideas on knowledge in organisations provide a structure within which to consider its critical value in the innovation process. These ideas also provide a useful analogy to training processes that are intended to benefit the organisation by exploiting knowledge. They focus their concerns on the contribution that knowledge makes to technological innovation in firms and provide a framework for interpreting this process. This provides insights into the issues of both innovation and training, yet, the linkage between individual learning and the performance of the organisation is not clear. Their use of external indicators to analyse the contribution learning makes to organisations clearly implies an expectation of process enhancement. However, the mechanisms by which an individual acts in the organisation to contribute to wider concerns is not offered nor clearly considered in this analysis. Though this may not have been the intention of the authors a consequence of using such survey analysis implies a direct relationship between these internal processes and externally observable outcomes. Such a limitation reinforces the need to understand the nature of the process.

Next, a paper by Willman (1991) on 'bureaucracy, innovation and appropriability' is used to construct and illustrate a different view of the process of knowledge exploitation in organisations. He notes that,

'Pavitt's (1991) observations are inductive, based on UK data. ...Although it remains unanalysed, the implication is that the organisation itself, rather than individuals who pass through it, retains and generates innovative capacity, even though individuals may be identified who propagate or encourage learning.'(*ibid.* :7)

In referring to the importance of knowledge to, in this case, the firm, Willman emphasises a distinction that Pavitt, and also Cohen and Levinthal, do not, namely that individuals are central to the process of innovation in the firm. Even if people are only able to function effectively as a group, in a particular firm with a unique structure, style of management and specific resources it remains the individual staff who are able to use particular knowledge for competitive advantage. For this reason Willman (1991) concerns himself with the development of innovation processes in the firm which focus on the expertise and interests of individuals. He considers that the knowledge base of the firm and the importance of business needs are related to this knowledge base which he calls the 'know-how' of a firm.

'We define 'know-how' as application of the knowledge base by the firm to particular business problems. It may or may not require technical expertise.'(*op. cit.* :9)

Willman (1991) defines the knowledge base as the total of information relevant to the firm in conducting its business. He concludes that this will be greater than the sum of the knowledge bases of individuals as these are not available to each other in a

structured form. A useful example here would be in a knowledge based firm such as a civil engineering company which is dependent upon the selection and integration of a variety of knowledge from individuals which no one individual could fully specify nor access. The knowledge base is the structuring of collective learning with the result being knowledge of benefit to the firm. Indeed he explains that the total sum of all knowledge in a firm will be far greater than the 'knowledge base' of the firm, as much of this knowledge is redundant in the organisational context. Not all knowledge is innovative or novel much is procedural and routine. Whilst technical expertise may not be a requirement in routine procedures it is an essential component in innovation for competitive advantage.

'The firm must establish organisational arrangements which generate and appropriate commercial know-how through the application of technological expertise.'(op. cit. :11)

Here the interest is in how an organisation can make such arrangements to generate know-how and the mechanisms by which it defines these needs. The way in which this is achieved are central to the study of innovation processes and also of interest with respect to training. In training a parallel problem exists: how training needs are specified in terms of the individual's job function. The means by which an organisation can determine specific knowledge requirements is therefore pertinent. Training is frequently concerned with the relationship between specifying knowledge requirements, often in terms of performance, and relating this to 'targets' for knowledge use. A common theme in the literature on innovation is how an organisation exploits targeted knowledge (Rothwell, 1992). Willman (1991) discusses this with reference to managerial responsibilities in an organisation.

'The CEO or strategic group charged with the direction of the business must operate with an understanding of the relationship between new technology and know-how. This does not simply relate to adoption decisions but also to the implementation process and the ways in which technology is subsequently used.'(op. cit. :12)

The need to be strategically aware of new knowledge requirements is evident within this discussion. In this case strategic awareness and direction are clarified not through the adoption of technology but by recognising the consequences of the implementation process. The way in which the technology is to be used is central to this implementation. What is of concern in this literature is the parallel observation that can be made about the investment in training. There are many examples where the decisions to purchase training are not directly related to the work-place implications of implementing this knowledge. The term 'exploitation of knowledge' in this thesis can be closely paralleled with the process of implementation detailed in the extract above.

Focus is thus on the internal distribution of expertise and the mechanisms available for transferring it. In the terms used earlier in this paper, the absorptive capacity of an organisation is its ability to turn expertise into know-how.'(op. cit. :14)

Here, the distinction is made between expertise of the individual and the mechanisms translating it into organisational know-how. This shift in perspective focuses the apparent gap in Cohen and Levinthal's (1991) explanation of absorptive capacity. The translation from the individual to the organisation is recognised as a selective ability of individual organisations, with the implication that some are better than others in this process. This characteristic appears to be evident in a number of organisations who are effective in managing the use of knowledge. Again references to 'innovation' can be substituted with training, particularly where training can be seen as the routinisation of knowledge use.

'internal appropriability, relates to the firms ability to capture and deploy know-how possessed by its employees. They are clearly related, in at least two ways. Firms which capture their own know-how will be better placed to absorb competitor's advances.' (Willman 1991 :14)

Once knowledge has been transferred to the organisation in the form of know-how the managerial concern rests with the deployment of this capacity from an organisational perspective. The observation that firms which capture their own know-how are better placed to do this is reminiscent of Cohen and Levinthal's (1991) observations of 'learning how to learn'. The statement implies that the process of effectively managing the translation of individual expertise to the organisational context informs the organisation about its own internal capabilities. It would seem logical that organisations with a good knowledge of their internal capabilities are likely to be quick in responding to technological opportunities. Mechanisms that enhance this internal awareness are likely to contribute to the performance of an organisation and its innovation processes.

Organisations that have an interest in translating their own internal knowledge needs into training provision, are more likely to be aware of the close relationship between training provision and performance improvements. This appears to be borne out when organisations rely exclusively on training provision from external suppliers. Whilst external knowledge will inevitably be needed it is clear that organisations must relate this source of knowledge to their internal context. Willman's illustration is limited to a well managed, constructive process. However we know that innovation and also knowledge exploitation from training are a complicated, iterative and developmental series of events.

'Within any organisation, there may be groups of employees possessing know-how which is neither available to the firm, because of employee retention of information, nor exportable elsewhere, because of its tacit and idiosyncratic nature. Similarly there may be tensions between the generation and enhancement of the knowledge base on the one hand, which may imply extension of involvement in process or product redesign, and appropriability on the other.' (op. cit. :15)

There can be many instances where the structure of an organisation or experience and roles within it are incongruent with the direction or function of the organisation. Often the development of particular processes or product improvement act in conflict with the

generation and enhancement of the knowledge base. Trott (1993) refers to experience in ICI, where;

'Mitchell suggests there is a trade-off between concentrating resources to try to build a strategic knowledge competence and spreading resources over a wider area to allow for the building of a general knowledge base. ...In practice most businesses settle for an uneasy balance between the two sets of pressures. (ibid. :29)

Clearly the enhancement of a knowledge base is more than a series of acquisition and deployment responsibilities of the management function. Each action represents a series of trade-offs between strategic positioning and operational performance. It would appear that knowledge acquisition, for both the individual and the organisation, is a complex trade-off. More detailed consideration of this issue suggests that particular instances of investment in either technological knowledge or training are selective and subject to strategic influence.

'These considerations serve to introduce some of the difficulties involved in capturing the know-how in a firm. It should not be assumed that such capture occurs naturally, the associated problems have been tackled in different ways by both economists and sociologists; their approaches in some ways are convergent.'(op. cit. :16)

Economists have interpreted this trade-off in terms of a game 'theoretic perspective' (Willman, 1991:16). The problem of transferring capabilities to the individual at a cost to the firm, as opposed to the loss of know-how to the organisation by not encouraging such strategic behaviour has been analysed by Willman (ibid.). Whilst the analytic framework is not of relevance to this line of argument, the characteristics which Willman identifies between differing organisations is of interest. Willman explains these relationships in terms of trust.

'Low trust employment relations are characterised by close supervision, impersonal rules, the encouragement of performance through disciplinary arrangements and by low levels of task discretion. In high trust relations, by contrast, supervision is seen as inappropriate, task discretion is high, and the typical career path involves promoting an individual through a series of posts with increasing discretion.. Simple reciprocity is assumed on the part of the employees; low trust relations foster low trust responses such as indifferent performance, absenteeism and information hoarding, while the individual advancing through a series of high trust posts will display increasing commitment to identification with the organisation in question.'(op. cit. :18)

Fox's (1991) study of work and trust relations has been used by Willman to consider the types of organisation and the way in which this acquisition of know-how, and its deployment, is not only dependant on the individuals within the organisation gaining expertise, but on the type of organisation and the way in which this potential is managed. His conclusion suggests the need to understand the relationship between technical competence and organisational capacity to adapt or innovate.

'A simple group within the firm may reach an accurate and durable understanding of the centrality of a particular set of technologies for business success, but there are separate questions related to the ability of the firm's organisation to be able to generate competitive advantage from that knowledge. The empirical relationship between technical competence and this organisational capacity need to be explored in more detail.'(op. cit. :20)

Clearly there is a need to understand the process by which benefits are accrued from the individual to the organisation. It is not sufficient to leave the organisation's exposure to technological opportunity to chance in the hope that this will result in innovation within the organisation. Cohen and Levinthal's (1990) view of knowledge as beneficial to the organisation is helpful in understanding the relationship of the organisation to its external environment. Yet if we wish to understand more about how an organisation can improve its performance it is necessary to consider the role of individuals in this process. Willman (1991) defines 'know-how' from an organisational perspective as distinct from 'expertise' which is based upon an individual perspective. In his introduction in which he recognises the limitation of inductive research base upon 'data' from external observations is helpful when considering the implications for research method. It implies that in order to understand internal processes we should research internal mechanisms. The use of external indicators as evidence of the success of internal processes restricts our knowledge to one of comparison between organisations.

Willman's conclusion that there is a need to undertake empirical research into the relationship between technical competence and organisational capacity seems well justified in the context of innovation processes.

3.3 Analogy with studies of internal & external knowledge transfer

An alternative approach to studying how organisations exploit knowledge is one in which focus is placed more closely on the role of the individual. This investigates situations in which the management of knowledge is of strategic importance to the organisation. Here, research and development (R&D) functions offer a convenient analogy for considering the way in which organisations transfer knowledge internally and externally. Literature centred on the role of the R&D function in technology transfer has more recently adopted a so called 'process perspective' focused on the individual to understand the contribution individuals and groups make in managing and achieving success from knowledge transfer. Earlier research approaches compared the R&D performance of firms using economic analyses. This approach proved to be of limited value in providing explanations about how successful outcomes are achieved or failures occur. Once more the training function in organisations provides interesting examples of knowledge transfer. Whilst the training function may not be a familiar route for innovation processes, its central function remains one of knowledge transfer. The difference here is that the sources of knowledge in training are more commonly those of established practices, or occasionally new knowledge to be 'shared' across larger groups of individuals.

3.3.1 Types of organisational knowledge

The concept of technological change as a knowledge transfer process is introduced by Gilbert, (1995), in order to demonstrate the relationship between organisational culture and technological change. This research considers the meaning of the 'learning organisation' and the approach of this phenomena through two propositions:

- *that becoming a learning organisation involves a change in the fundamental structure and behaviour of the organisation, i.e. a change to the organisational culture;*
- *that organisations need to understand what the processes are that enable them to learn. (ibid. :46)*

Trott's (1992) research breaks the inward technology transfer process in to - Awareness, Association, Assimilation and Application. Gilbert (op. cit.) uses this model as the starting point to develop a knowledge transfer model which identifies four stages of knowledge transfer as; '*acquisition, communication, adoption and assimilation*' (op. cit.). These stages provide a framework with which to structure the implications of transferable forms of learning at the organisational level. It is argued that by acquiring knowledge, communicating this knowledge within the organisation through a variety of mechanisms, and thereby applying this knowledge, that organisations can as a group of individuals learn and establish new and revised routines and structures. This adoption of knowledge into the processes of an organisation is referred to as the assimilation stage and is recognised by Gilbert (1995) as the demonstrable evidence of learning by the organisation.

It is clear from this work that not all forms of knowledge are as easy to establish within organisational routines as others. Here Gilbert, in her study of a private banking group, uses 'instrumental' and 'developmental' knowledge to refer to the use of distinct types of knowledge with characteristic applications;

'[Instrumental] Behaviour in terms of procedures, i.e. that relating to structural knowledge shows evidence of being transferred from acquisition to application. Areas such as customer focus, awareness of what is required, application of new standards and targets, use and application of IT are common across all functions.' (op. cit. :169)

However it is clear that at differing levels within the organisation the nature of what constitutes instrumental knowledge in the organisation will differ. As would be expected from a hierarchical system the procedures accepted as routine, or the norm, at one level are unfamiliar or an infrequent development of expertise at another. This is consistent with the observation:

'The perception of the application of structural knowledge is not consistent across all functions, relating in the same way as in the acquisition of knowledge to a more strategic approach for higher levels and more operational for lower grades, i.e. the most senior grade mentions providing

support for the new standards, something that is not perceived to have occurred by the lower grades. The more junior grades concentrating on areas such as new logo, colour and quality of stationery and dress standards.’ (op. cit.)

Clearly there is evidence of a category of knowledge in organisations that is procedural in nature yet which differs in nature and complexity of task throughout the hierarchy of the organisation. By recognising knowledge processes that use familiar structures to achieve assimilation this makes a distinction between the application of this form of acquired knowledge and that which is recognised to be ‘developmental’.

‘[Developmental] The areas related to autonomy, responsibility, accountability and personal development, i.e. those relating to developmental knowledge are much less clear. There is a sense that arises from the perceptions of the interviewees that there is an espoused change in individual responsibility and accountability. However this is not clearly demonstrated as being transferred into demonstrable activities from the data. Senior levels i.e. above manager level, within the two functions M and O mention ownership and accountability. Yet this is not reflected in the activities of the lower grades. Similarly only the two most senior functions C and A with one non-managerial grade perceive autonomy to be greater. Indeed it is only the most senior functions that mentioned having ‘confidence / trust in staff to do the job’. However five of the functions (only one below manager) did perceive there was greater opportunity to develop their own job.’ (op. cit.)

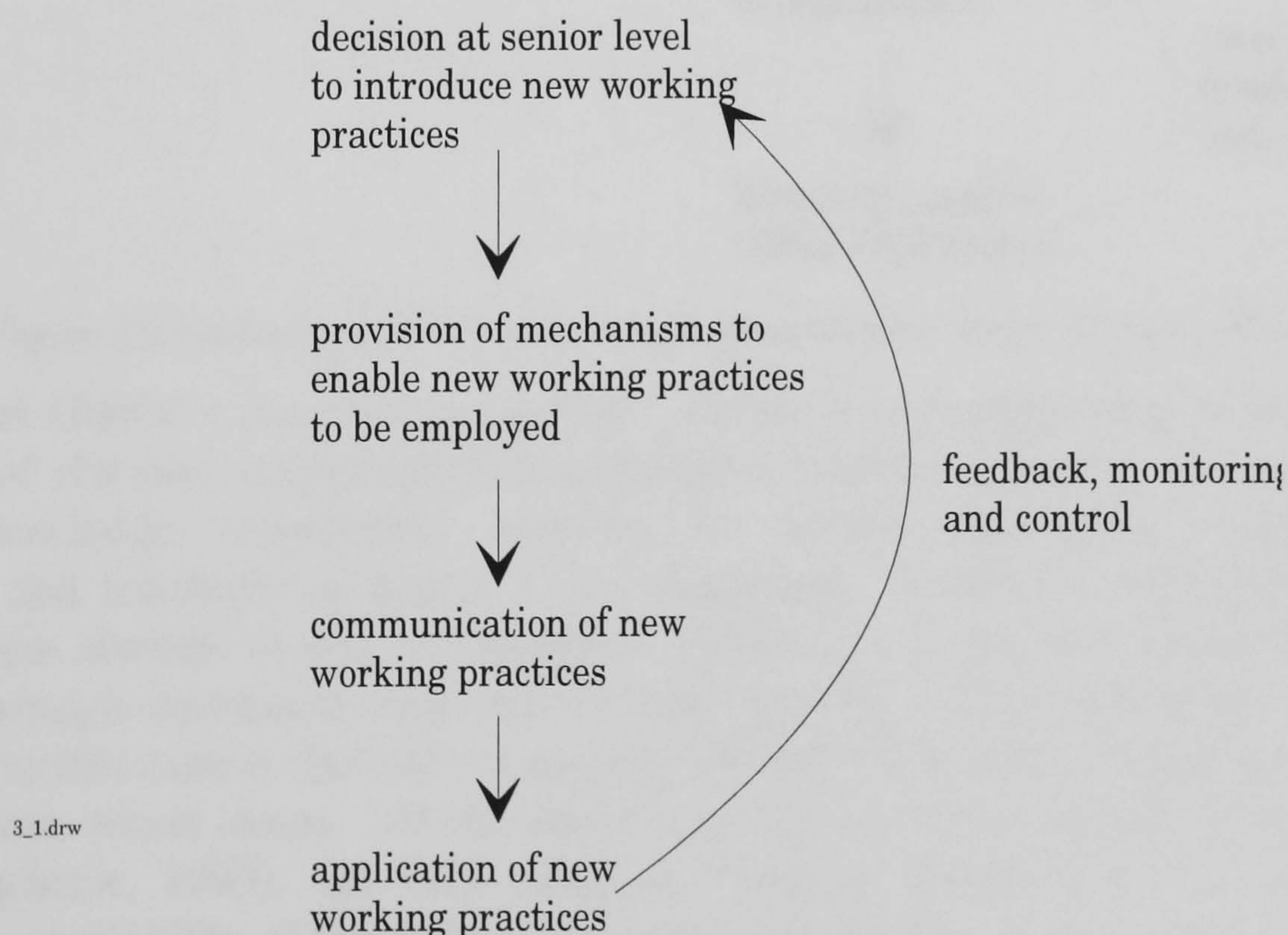


Figure 3.1 Application of Structural Knowledge (Gilbert, 1995)

These references to ‘instrumental’ and ‘developmental’ knowledge have direct implications for learning at the level of the individual. Gilbert’s discussion of the differing types of knowledge assimilated into an organisation recognises a difference both in the form of knowledge learnt by staff at each level in the organisational

hierarchy as well as the difference between routine knowledge use at one level and applications that demand structural or procedural change as a central part of its application.

Argyris (1978a) defines the opportunities for managers applying developmental knowledge from one level only as being that of '*single-loop learning*', Figure 3.1. This recognises the use of developmental learning at one level but the failure of the organisation to learn from the experiences of structural change other than by a direct feedback of monitoring and control.

Gilbert modifies Argyris's later '*double-loop learning*' model for the application of developmental knowledge (Figure 3.2). This model clearly illustrates the role of individuals in providing information about the experience of structural and procedural change in the organisation to different levels in the organisation.

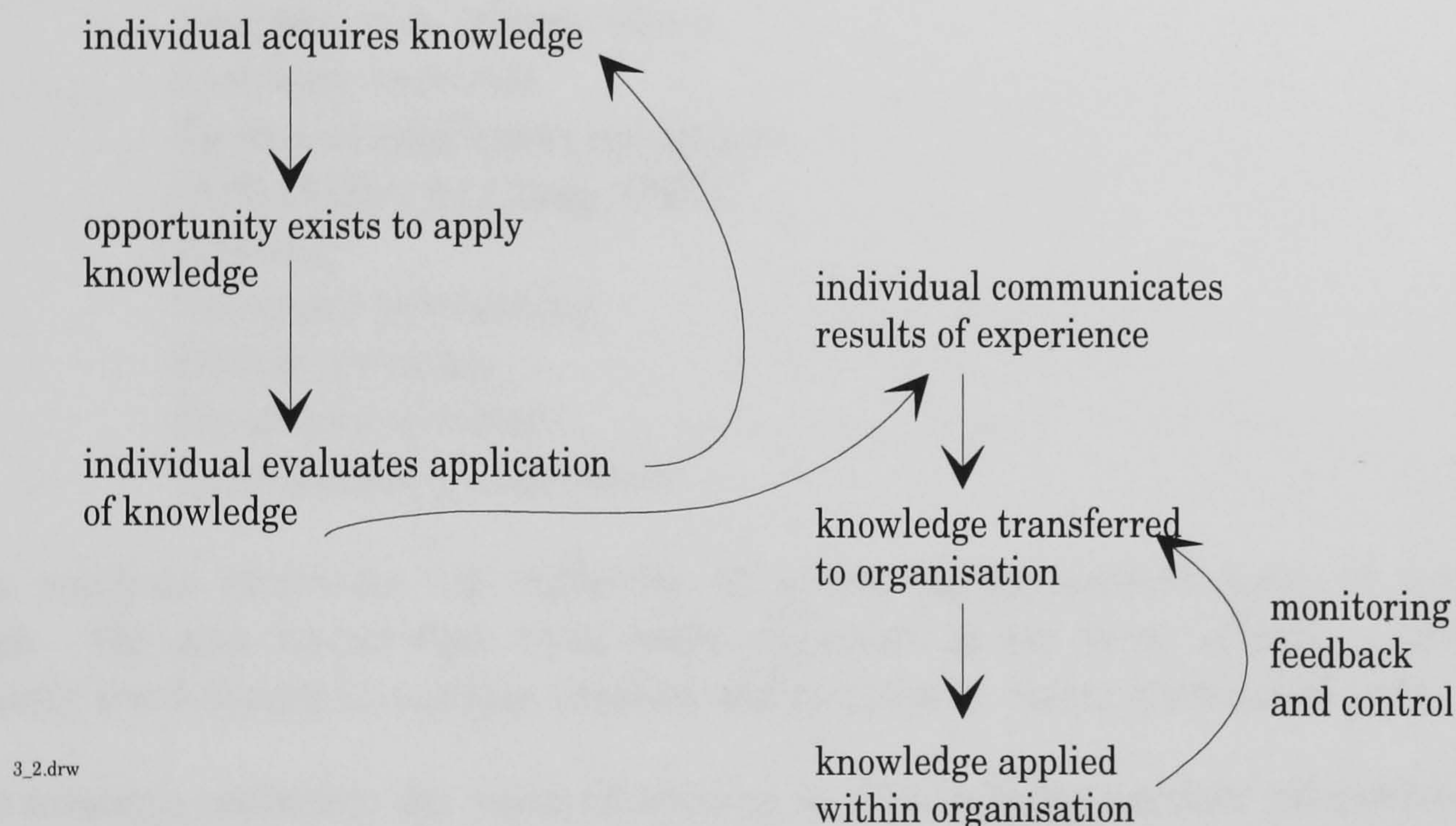


Figure 3.2 Model for Application of Developmental Knowledge (Gilbert, 1995)

The value of Gilbert's research is twofold. Firstly it recognises that in the successful movement of relevant technological knowledge a number of factors are relevant in the firm. Knowledge acquisition, opportunity, critical evaluation, communication, monitoring and feedback all appear to be important. Should an organisation without these qualities attempt to buy technologies 'off-the-shelf' success is only likely to be achieved through increased exposure to this specific knowledge form. Access to knowledge in this case is therefore necessary but not sufficient. A clear parallel can be identified here where many 'off-the-shelf' training resources remain unused, 'on-the-shelf' (Longhurst, 1993). In such cases no evidence exists of a causal relationship between the availability of the training resource and its use. If the organisation's ability to develop effective mechanisms with which to stimulate learning cannot be achieved then training seems likely to fail despite the accessibility of the resource.

The second interesting feature of this work is the qualitative nature of the positive feedback. There are no defined structural requirements to support the application of developmental knowledge. Clearly structural elements in the organisation such as

resources etc. are necessary, but it is the quality of the application process that is essential in order for senior managers to apply developmental knowledge effectively. A research approach that considers internal mechanisms for knowledge use should offer insights that would not otherwise be available to more traditional research which focuses on external organisational indicators.

Technology transfer channels are not exclusive to the R&D function and Craig (1992) adds to Allen's (1977) list of the potentially useful channels in many organisations

Mass media;
Literature (magazines, journals etc.);
Mobility of labour
External sources (consulting etc.)
Vendor's communications
Company research
Customer's communications
Company research
Technical staff communications
 (Added later by Craig, 1992)
Training
Computer networking
Mobile servicing
Production control
Total quality management

Allen's analysis identified the difficulty in analysing the performance of a transfer channel. He also found that what were expected to be most effective, and most commonly used channels, namely vendors and customers, rarely performed well.

Craig's research considers the value of training as a knowledge transfer channel and uses the development of a training resource to 'track' the difficulties that occur when technology in the form of new technical knowledge is introduced into the firm. He states:

'Evidence from the case-study material points to significant difference between levels of the work-force, and in particular between senior and middle managers levels. Without exception the senior managers responded positively to ideas and the content of the material; all acted as Champions, and in some cases as sponsors in support of the project....

...it is possible to identify two explanations for this observed difference. One is that the role of the senior manager demands a more holistic approach, and any ideas which are seen to promote such an approach are likely to be welcomed....'

...Another explanation is that the ideas were presented in different ways to the respective levels within any one organisation. At the senior manager level the presentation had to be in the form of description; aims, objectives and how

ideas could be implemented....At the middle-manager...level the presentation had to be in the form of prescription rather than description....transferring to the shop-floor...it was at this point that some of the essential ideas (about the training)...could be lost. (ibid. :179)

The complexity of the transfer process of technical training is evidently one of greater research interest than merely that of assessing the extent of individual exposure to the material. This study highlights some of the difficulties that may arise as well as the essential requirement for them to be overcome if training is to succeed.

3.4 Implications for a research approach

The central theme of research literature that focuses on the exploitation of knowledge has led this discussion to three main conclusions.

Knowledge is essential for the performance and development of an organisation. However the capacity of an organisation to absorb new knowledge is more than a function of exposure that the organisation has to new knowledge.

In order to understand the processes of new knowledge acquisition the organisation cannot usefully be interpreted as a 'whole' entity. Any consideration of an organisation's ability to acquire and use new knowledge must recognise the ability of individuals within the organisation to convert individual 'expertise' into organisational 'know-how' and the characteristics that may influence this.

If the conversion of 'expertise' to 'know-how' offers useful insights into the improved use of by an organisation then research that intends to study knowledge exploitation must necessarily consider the internal processes by which this occurs. Such a study of internal processes should be concerned with the role and performance of individuals with respect to the organisation. This is in contrast to studies focusing exclusively on either the individual or the organisation.

CHAPTER 4

4. Research objectives and research design

'Education is what survives when what has been learnt has been forgotten.'
(Skinner, 1964)

4.1 Introduction

From the issues discussed in Chapter 1 it is recognised that there is a need to understand better the way in which mis-match occurs between the learning experiences of staff and the performance benefits gained by the organisation. The discussion in Chapter 1 shows how the introduction of technology based training highlights difficulties in identifying benefits from formal learning in organisations. Similarly the determination of who benefits from learning is also problematic. The significance of individuals for organisations to benefit from investment in training, considered in Chapter 2, shows the importance of recognising the separation of learning experiences to the organisation's function and development.

The observation that there is a mis-match between the 'agenda' of those determining training provision and those expected to benefit from this investment suggests a research approach that shows this occurring and uncovers features necessary to overcome this mis-match. Such an approach needs a series of levels within the sequence of training investment and performance improvement. Therefore the organisational level at which training is determined is relevant to this study as is the role of managers who determine training needs. Likewise the proximity in role managers who determine training needs and those line managers anticipated to benefit from enhanced staff expertise is of interest. In total this sequence of training specification and benefit to line managers should contribute to organisational change.

4.1.1 Research issue

An appropriate research approach needs to consider the organisational features of the learning context, i.e. under what managerial and staff organisational conditions is mis-match likely to occur. As well as different organisations and different types of training it seems that other factors similar to these influences are likely to vary the chances of success. However the question remains:

- What are the characteristics of this process likely to be for differing managerial needs?
- How do these needs result in differing types of knowledge requirements?
- What do the consequences of differing needs have upon the optimisation routines of training?
- How can organisations establish processes of change or respond to external pressures by improving learning through training?

It is apparent from the issues raised in Chapters 1, 2 and 3 that there are symptoms of many types of 'failure' in training. This appears to be evident even when training is directly targeted to meet conventional functions of task related training in an organisation such as the training of employees in production skills. However training problems are not exclusive to the routine functions of an organisation. Whenever training is used to contribute to organisational development it appears that considerable difficulties exist in targeting and identifying the benefits, if any, from this investment.

In short a research study has to be designed:

- to focus investigation on the differences between models of learning provision, as noted in Chapter 2, and models of organisational learning, Chapter 3, and thus provide insights as to the potential for success or failure of specific knowledge applications from formal learning or training.

As it is the internal mechanism or process of learning within the organisation which is of interest Cordey-Hayes (1992) notes that the research must address the:

1. *importance of the continuity of learning and the evaluation of training;*
2. *cumulative effects: dynamical reinforcements or 'stepping off' the escalator;*
3. *importance of needs analysis;*
4. *models of training: critical factors vs. process or knowledge acquisition;*
5. *learning in organisations and models of training as the key to effective training, rather than 'training' as the key to learning in organisations, and the implications that this has for viable organisations.*

In this research it is proposed that a useful conceptual approach to structuring the method for such an issue is to interpret observations of organisational events using systems thinking. This approach makes a distinction between the notion of systems as perceived and 'real world' events. The major concepts which are useful in the formulation of a system framework in training are described by Hays (1992) and include the following:

1. *Systems are bounded sets of interrelated parts, such that changes in one part will cause changes in other parts.*
2. *Systems act to maintain internal consistency even in the face of external changes.*
3. *The emergent qualities of a system cannot be explained by mere addition of parts; rather, these qualities must be explained by relations and interactions within the system.*
4. *Systems are always embedded in a hierarchy of subsystems and suprasystems, and interactions occur between system levels at all times. Every system is a component (subsystem) of a larger system. The larger system which includes the system of interest is called a suprasystem.*
5. *A system, when viewed from its own level, seems autonomous and is seen to exert control over its subsystem. On the other hand, when viewed from the level of a suprasystem, it appears to be under the suprasystem's control.*

Furthermore, suprasystems appear stable from the perspective of their subsystem, whereas subsystems appear variable from the perspective of suprasystems.(ibid. :259)

The use of systems concepts to examine interpret is well established in training research and contributes significantly to the understanding of learning problems throughout different types of organisation.

Systemic models of instruction offered in the training literature have originated from the application of a systems approach to training. This approach acknowledges the effect of boundary conditions upon the training function in an organisation. An established area of analysis using systems principles to understand organisational problems is that of 'failure analysis'. Failures analysis methods are frequently referred to within the field of systems approaches (Fortune & Peters, 1990; Bignell et al, 1977). Here, four propositions from Naughton & Peters (1976) suggest that the basis upon which systems thinking and the analysis of failures are:

1. *No failure occurs in a vacuum. It always occurs in the context of a system or systems.*
2. *In order to arrive at a useful understanding of a failure, you have to understand its systemic background.*
3. *If we accept that all failures are, to a greater or lesser extent, systems failures, then we have to accept that those failures may not be just 'random' or 'unfortunate' or 'tragic' events but may actually be outputs of a particular system.*
4. *Systems thinking is a useful way of conceptualising the systemic background of a particular failure. (Naughton & Peters, 1976:16)*

The failures analysis approach recognises that most major failures do not arise simply from single causes. It is usually the complexity of activities and the large number of interconnected subsystems that result in a sequence of multiple or unexpected reactions that make failures almost inevitable. Peters (1976) defines systems failures as those situations where there are outputs from a system which are not those intended nor desired by those associated with that system. It is these unintended or undesirable consequences of systems failure which are of particular interest in the learning environment. As learning experiences need adoption into the organisation in some form, the systems approach offers a useful approach by which to consider areas where success or failure in meeting specific objectives may occur. By definition, as systems are the result of interactions between subsystems and their environment the study of single factors is inappropriate. Fortune & Peters (1990) argue that the scientific traditions based upon the isolation of individual components is inappropriate as it will only deal with the relationship between a very small number of components. Such a narrow approach to 'failure' would make it incapable of understanding the nature of relationships found in complex situations. In contrast a systems approach places as much emphasis on subsystems and their relationship to other components as on the components themselves.

Fortune & Peters (op. cit.) analyse different approaches and note that many paradigms of systems analysis use the analysis of control or open-closed feedback. However, they suggest that a paradigm of formal systems, in which structure is important, is a useful way with which to consider the essential features of a system. This is a set of relationships or structures capable of purposeful activity without failure. This structural framework includes:

- *continuous purpose or mission;*
- *a measure of performance;*
- *a decision-taking process;*
- *a degree of connectivity between the components;*
- *an environment with which the system interacts;*
- *boundaries separating the system from its wider system and the wider system from the environment;*
- *resources;*
- *some guarantee of continuity.(op. cit. :387)*

Richey (1986) endorses the contribution that a systems approach can make to the study of instructional design. However, her study of theory in this area concludes that limitations exist in the theoretical development of instructional design when related to organisational contexts. Therefore in order to better understand the difficulties in investigating benefits from training, it is proposed that to understand this process the failures analysis method may be a useful approach. This may be particularly helpful in the early stages of exploratory research.

The variety of studies using internal knowledge processes referred to earlier in Chapter 3 have all provided useful insights by qualitative research methods to elicit conceptual models of process. This approach provides an opportunity to draw parallels across differing organisations. Common amongst all these studies is the use of an 'elicitation device' has been used to uncover the generic nature of each change process. In Seaton and Cordey-Hayes (1993) the work originates from an analysis of the factors influencing the process of technology acquisition in order to present a model of technology transfer. Trott (1993) uses cognitive maps of internal technology transfer in the R & D function to facilitate discussion with ICI staff concerned in the process and Craig (1992) produces a training product as a device to observe the reaction of firms to external knowledge influences.

It seems clear therefore that greater insight to the process of interest can be gained in the proposed study if:

1. knowledge of the process itself determines the criteria with which to specify the system of interest, i.e. determining the criteria of selectivity;
2. the views or perceptions of main actors are taken into account;
3. a device or variety of investigation devices are used with which to elicit knowledge of the process;

and where appropriate,

4. the presentation of a conceptual model can be used to summarise the generic qualities and insights gained of the process.

Adler (1992) defines a series of process categories or stages of development in which technical functions in organisations can be ascribed to. He concludes that structural elements within an evolving organisation do not naturally co-evolve and thus need managing. So a picture develops of technical functions, and in this case of training, which have boundary conditions inside the organisation. As the organisation evolves, the technical function does not automatically evolve with it. It has to be managed. Thus the role of management is to determine the co-evolution of these technical functions.

4.2 Research question & objectives

The previous section considers the research issue and the use context of systems thinking and instructional design methods with respect to training in organisations. It is useful to summarise concerns about the success of training in a series of objectives to direct the research. These are derived from a single question:-

- Is the failure of conventional training, in meeting organisational needs, due to it being treated as a project, task centred ‘function’ rather than considered as a process?

This question enables a series of research objectives to be derived that are concerned with the nature of training, features of organisations and the nature and value of knowledge in a variety of contexts.

It is clear that to begin with it is necessary:

1. To identify, in a diverse set of organisations, the nature of ‘failures’ and limitations of the conventional training function.

By setting these as basic requirements for the study it is then possible to structure an approach that draws upon the models of training and knowledge in Chapter 2 and 3 to direct the research to:

2. Use models of instrumental (often technical) and developmental knowledge accumulation process models to examine the limitations of task and functional models of training.

These models commence with the optimisation of routine functions to which training is normally directed. These models are by definition task or function based and therefore do not feature the individuals that establish these learning processes as ‘identities’ i.e. the managers.

From this question of ‘functional’ models of training it is then appropriate for the research to focus on the limitations of the training function and:

3. To contribute a 'training perspective' to the development of 'process' and cumulative knowledge models of the organisation.

The absence of cumulative knowledge models originating in training is evident in Chapter 3. Training has not been effectively integrated into knowledge models within organisations and this raises the question as to what extent integration, if at all, is possible.

Finally the research should focus on the wider characteristics of training failure:

4. To identify issues of organisational structure and managerial autonomy, the opportunities within which to make decisions that may influence the exploitation of both technical or instrumental, and developmental knowledge.

4.2.1 Research propositions

From these research questions it is possible to draw from the discussions in Chapters 2 and 3. In doing so it is possible to propose directions for the research where major influences as the success or failure of training may be seen.

The issues raised in Chapters 1 & 2 form the CEST study (1989) and references to the failure of a variety of training delivery mechanisms (Longhurst, 1992) the proposition that is relevant is:

- the extent to which structural attributes of an organisation will be related to types of conventional training;

from Chapter 3 it is appropriate to consider:

- the extent to which managerial autonomy is related to success or failure from training provision;

and finally when reflecting upon Chapters 2 and 3 together it is appropriate to consider:

- the extent to which the complexity, sophistication or level of knowledge is related to the difficulties in achieving benefits from learning within the organisation.

4.3 Understanding organisational training issues

From the earlier propositions it is important to select the research activities necessary to gain a better understanding of the substantive training issues as well as, the issues that determine a wider contribution to knowledge.

It is clear that a training centred view will provide insights into the problems of transferring individual learning into the organisational context. However it is also clear that these insights may offer a understanding of the underlying causes. Without a broad set of issues that are directly training related it would not be possible to develop the

research theme and provide insights into current practice. Therefore it is appropriate to begin with an approach that identifies the breadth of training and management issues that are of concern.

4.3.1 Obtaining information from organisations

The research activity has been driven by a number of planned and opportunistic approaches to gain access to organisations so as to get information on training problems. A first group of companies, referred to in Appendices A and B were contacted through the fieldwork of the CEST study (1989). A series of further contacts were arranged with companies referenced by the first organisations as well as contact with multimedia manufacturers and industry promoters of this media. This broad range of organisations in the first group covered both manufacturing and service sectors and raises a number of issues about company size, size of functional units, training resource distribution and cost-centre or accounting methods for training provision.

Access to a number of small and medium sized enterprises (SMEs) became available through the researchers involvement in a study by Craig (1992), funded by TEED¹. This opportunity allowed the concern over organisational structure being influential upon benefits from training to generate detailed questions. Here the need for organisations to restructure their internal organisation to benefit from new forms of knowledge provided by training were investigated.

This study by Craig (ibid.) raised two concerns which were then addressed by three activities:

1. What stage, or stages, of training development are particularly influential upon the maximisation of benefits from formal learning.
2. Is an improvement in the sequence of activities in formulating training an adequate measure to achieve these benefits or are managerial influences important in this process.

Therefore the following activities were undertaken for the research in this thesis:

- consultancy exercises to contribute to the design process of a training programme to identify trainer and managerial concerns of knowledge exploitation.
- preliminary discussions followed by an in depth recorded interview with a project manager in a knowledge based organisation also had a responsibility for both training provision and its exploitation in the company.
- an in depth interview with an experienced senior manager who had responsibilities in a utility company that combines provision for both support of routine functions as well as organisational development.

¹ Training Enterprise and Education Directorate, of the government Employment Agency.

These three exercises each used models of training and learning to structure the elicitation exercises whether in a consultancy or research capacity.

4.3.2 An interpretive scheme - concepts and models

The means by which to acquire and structure information from fieldwork activities is a relevant feature within the research. When research is focused on a socially constructed issue of concern it is important to enable the variety as well as detail of information to be recorded. In this case diagrammatic models of stages within learning, training and knowledge transfer processes have been provided as a means to encourage and structure interviews dialogue.

This mechanism, whilst successful in acquiring information then demands an interpretative scheme with which to develop concepts and models from the activity. Throughout the research the mechanisms used are derived from the systems thinking literature and providing an interpretive framework for the fieldwork. These are discussed further in Sections 4.4 onwards.

4.3.3 Access, substantive issues and the validity of interviews as data

The suitability of interviews as a research technique to identify training and knowledge exploitation decisions were considered prior to their adoption as the major technique. No alternatives exist that offer such a rich and effective picture of processes in organisations whilst minimising the intrusion to staff. This is particularly important where the respondents are senior managers or staff with a high level of responsibility for the organisation's performance. In these cases it is counter-productive to impose lengthy observations and questionnaires on managers who have clear ideas about what they are attempting to do, and only a limited period of time with which to communicate these ideas. In such cases working from a non-directive agenda such as 'open-interview' is more appropriate. The validity of what people say in interviews and do in action has been the focus of much investigation in the field of social research and there has been a considerable amount of research into the relationship between what people say and do, e.g.

'Social scientists have long been tempted to assume that respondents' behaviour is congruent with their attitudes. Yet the evidence for this link has never been very strong.' (Foddy, 1985:3)

One branch of research analyses the statements of what people say in job interviews related to their performance in the workplace. Early work in this area demonstrated the validity of specific question types and the reliability of the answers when compared to job performance. A number of factors may influence the responses of individuals and not all can be explained by the failure to remember events correctly or to tell the truth. The lack of a clear conceptualisation of an issue will influence the attitudes and concepts being measured, and how they are interpreted. Likewise small changes in wording can produce major changes in the response. The mis-interpretation of

questions by respondents is also of concern with perhaps one influential cause being that of the sequencing of questions and its influence over the responses.

Belson (1986:36) below concludes that the principal causes of error in gathering data through survey and interview procedures are as follows:

- a. respondents' failure to understand questions as intended;*
- b. a lack of effort, or interest, on the part of respondents;*
- c. respondents' unwillingness to admit to certain attitudes or behaviours;*
- d. the failure of respondents' memory or comprehension processes in the stressed conditions of the interview; and*
- e. interviewer failures of various kinds (e.g. the tendency to change wording, failures in presentation procedures and the adoption of faulty recording procedures).*

Clearly the importance of ensuring the validity of responses is critical to the research and a number of actions can be taken to ensure this (Foddy, 1993). One common approach has been to compare specific statements against observations. This provides a useful mechanism for comparing interview statements using proposed actions with the actions of respondents. However with interviews there is always the risk of post-hoc justification or a shift in emphasis in explanation to draw attention away from problem areas. This means of explanation can be common particularly where individuals feel threatened by being seen to have failed, made mistakes or be directly compared with others. Where this risk occurs statements can be compared either with later similar circumstances so as to observe actions, or, the rationalisation can be corroborated by interviewing others staff separately who are involved in the same decision process.

4.3.4 Access to organisations

For each phase of the research devices to engage companies with the problem issue are designed and used. This is particularly important where the information sought in the research is held by people in managerial roles with little time for reflective discussions on the varied elements of their training role. In the following research, appropriate ethical devices are used to gain access to firms. Time constraints are not the only concern. Most staff in an organisation would find discussions on the role of the training function difficult to justify, and in many cases, difficult to benefit from. For this reason the researcher used issue based, consultative and evaluative roles to contribute and understand the role of formal learning in each organisation. These activities not only enabled the researcher to understand the organisational context but to benefit the organisation and thus maintain a continuity of involvement.

The devices used in the research fieldwork include: the potential use of technology based training and fault-finding training in a consultancy role on behalf of the Learning Technology Unit (LTU) at the then Training Enterprise and Employment Directorate (TEED). Emphasis in the later stages of the research activity is placed on knowledge based organisations as this reflects both the UK trend in the competitive restructuring of organisations and the focus of interest in companies where changes in technical

knowledge are critical for survival. Here conceptual models derived from the literature discussed in Chapter 2 and 3 are used in discussion with senior line managers having responsibility for training.

4.3.5 Analysis techniques

Collating the training and knowledge issues that were of central concern to a wide variety of organisation was recognised to be of particular importance within the study. Thus, for the analysis of training issues in the preliminary study it was appropriate to address the breadth of concerns that reflected the failure of conventional training.

In larger organisations, particularly those in the service sector, the constancy of training messages and the continuity of learning delivery were believed to be a major concern. A particular feature of this training is the simulation of learning experiences for the numbers of staff to be trained. For the smaller organisations earlier studies had indicated the need for small firms to have access to low cost, updatable training resources.

A number of organisational factors were of relevance, namely; company size, organisational structure, operational sector and rapidity of change in operations. An interesting feature is when the sub-divisions within major companies result in them effectively operating as small firms or cost centres. These organisational structures can provide flatter organisational structures but negate the full economies of scale operating for firms of this size.

Further issues were in managerial experience and the level of consideration given by managers to training and knowledge issues.

4.3.6 Nature of output

Information requirements to meet the first research objective, Section 4.2, determine the specification of research output. At the outset, the nature in which this information could be collated was unclear, however it was recognised that it needed to meet the following criteria:

- provide evidence from a diverse set of organisations;
- focus on failures of conventional training;
- focus on the features of learning processes in an attempt to understand learning processes as opposed to training delivery.

The importance here is to recognise the need to establish a classificatory system or way in which to group the characteristics of training failures that is relevant to explaining difficulties in the processes of learning and knowledge use in organisations.

4.4 Understanding managerial autonomy and instrumental knowledge

Consultancy work with the Commission for Local Administration enabled the researcher to both facilitate the structuring of a training programme evaluation as well as develop a structure for establishing a trainee profile system.

4.4.1 Substantive issue

The research interest within this research activity was twofold; firstly, how the design process could express managerial knowledge needs and secondly, how the translation of implicit knowledge into explicit statements of learning could be matched to agree with and be further developed by senior complaint investigators within the CLA.

4.4.2 Interpretive scheme

An interpretive device was used to translate the classification of issues arising from the consultative design exercise into a conceptual model of the training and learning mechanisms, Figure 4.1. It was evident that central activity of the consultancy process was a translation of one knowledge model, the managers, to that of the trainers. It was then clear that this process should be recorded as an indicative element of the problems experienced when applying a training perspective to problems of knowledge specification.

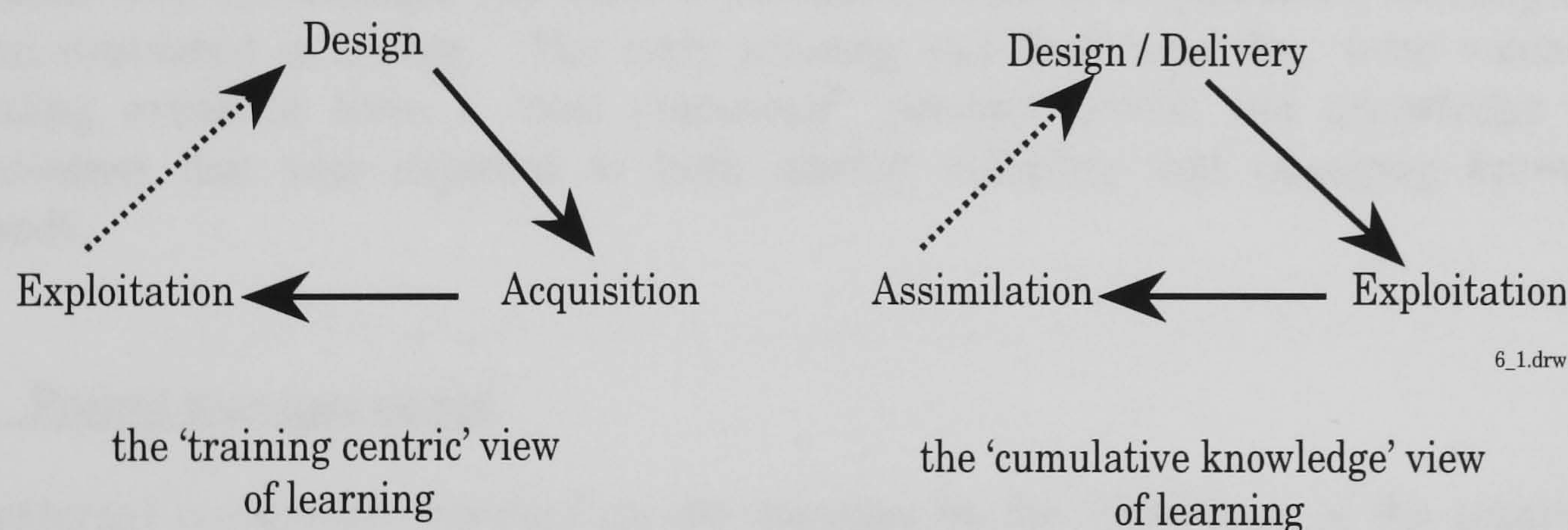


Figure 4.1 Training centric and cumulative knowledge views of learning

4.4.3 Analysis

To derive a managerial and training analysis of the issues it was necessary to identify a method of reflecting upon the consultative process taking place within the CLA example. It was important to ensure the relevance of the research activity to the process of 'matching' knowledge in an organisation. This is in contrast to research activities that assist in understanding the effectiveness of training delivery.

4.4.4 Nature of Output

The output of the research activity was designed to recognise the nature of the issue and the organisational 'process'. Therefore a conceptual method was proposed in the design. This was in contrast to proposing to elicit statements from organisation as to what knowledge or training was required. It was recognised that for most organisations training needed to be developed and demonstrated that could then be taken up as ongoing learning processes in the organisation. Maintaining 'ownership' or control over the training programme was a critical factor for many organisations to ensure relevance.

The output of the research was in recognising the perspectives of knowledge statements that were defined during the consultative process and how these differing views could be aligned. Thus the output of the activity was recorded as a series of diagrams; a conceptual map of training and cumulative knowledge models, Figure 4.1, and 2 diagrams, referred to as the 'operation tree', Figure 6.4, and the assessment profile', Figure 6.5 in Chapter 6.

4.5 Understanding organisational constraints on the managerial role

The research activity in Chapter 7 was designed to uncover the managerial constraints upon training investment in an uncertain environment. This research activity was based upon an opportunity to discuss training and knowledge management issues in a civil engineering consultancy. The issues of concern had been discussed on previous occasions with the manager and these were then collated in a concluding meeting during a semi-structured interview. The early meeting and final interview were valuable in providing evidence from a 'cost conscious', product driven and knowledge based organisation that was exposed to both market volatility and changing knowledge demands.

4.5.1 Project manager issues

The external constraints imposed on the manager by the operations of the commercial market were the first considerations that the manager had to take into account. All training decisions were influenced firstly by the immediate needs of a contract and secondly by the future plans for staff development within the group.

A further consideration was the requirement to ensure that his junior staff were given adequate opportunity to fulfil their institutional requirements to complete membership examinations and professional practice experience.

4.5.2 Interpretive scheme (SFAR)

Benefits from learning were assessed by the manager directly in terms of current or future opportunities to exploit knowledge within the firm. The essential priority of issues for the project manager demonstrated that enabling knowledge exploitation was

in many circumstances a significant cost to operations. Thus the firm failed to receive, or have any opportunity to receive, benefits from their investments in training. This was a central concern to the manager and could be successfully expressed using a model of knowledge exploitation - SFAR - Structural Factors, Assimilation and Relevance.

The interpretive scheme- SFAR - was used to show the difficulties experienced in organisations of knowledge exploitation. This was in contrast to the evaluative models of training specification and delivery, in the analysis of training failure. It was necessary to design an interpretive scheme to make a descriptive transition from the training perspective to one taking account of the organisations knowledge needs. This then had further significance to the study when related to the earlier model developed in Chapter 6.

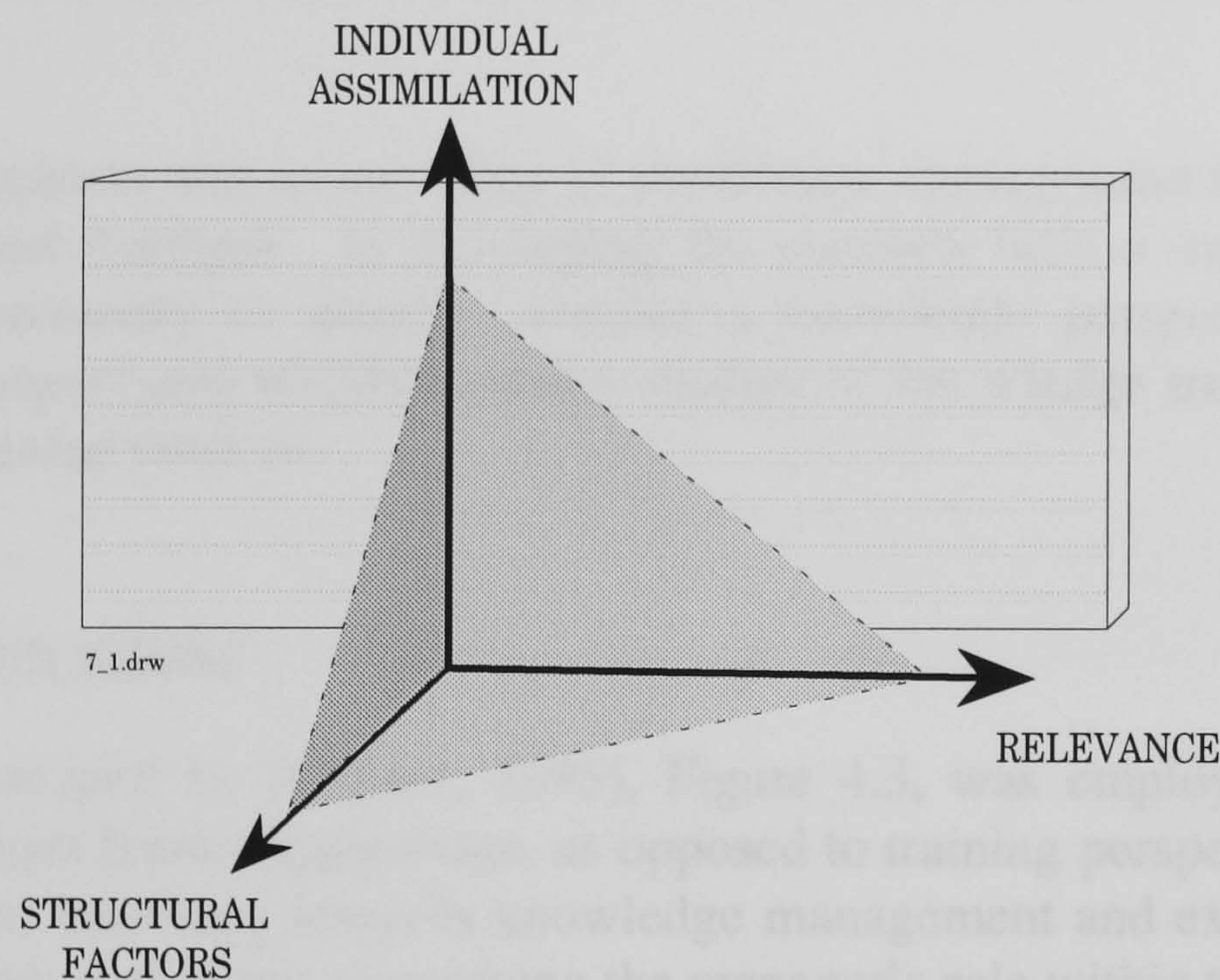


Figure 4.2 Knowledge exploitation - structural factors, assimilation & relevance

4.5.3 Analysis

Analysis of the interview was structured using 'systems failures' ideas to identify training failures, as defined by the manager. The features of failure were then translated into the SFAR model. By structuring the analysis in this form it is possible to establish the nature of dimensions within the knowledge exploitation model. These are then related back to organisational attributes and issues raised in the earlier Chapter 5.

The relationship of Chapters 7 and 5 are important in assessing, from a selected interview with a manager, the representative nature of the comments made by the manager. It was clear that the experiences from the previous elicitation and consultative activities in Chapter 5 are matched by views reported in Chapter 7. It was clear that generic components within the training failures analysis were being uncovered.

4.5.4 Nature of output

The two outputs from this research activity were; firstly a diverse range of issues and experiences that could be translated onto the SFAR model providing an exploration of the dimensions of SFAR; secondly, a collation of issues that represented the ‘non training’ knowledge concerns of the organisation. Important features of the limitations of conventional training functions and the training centred view of knowledge specification are illustrated by this activity. The clarity with which this activity distinguishes the management of knowledge to that of training is a useful distinction within the study.

4.6 Understanding the characteristics of cumulative and developmental knowledge

The final requirement was to test ideas of knowledge management from the perspective of an experienced manager. In developing the research from a training to knowledge focus it was necessary to identify whether a knowledge perspective was a central concern of managers and whether current models of knowledge transfer could provide insights into training failures.

4.6.1 Interpretive scheme

The model developed by (Gilbert, 1995), Figure 4.3, was employed to structure the elicitation of issues from a knowledge, as opposed to training perspective. This assisted in structuring the interview towards knowledge management and exploitation problems and raised a number of issues concerning the manager's role within the organisation.

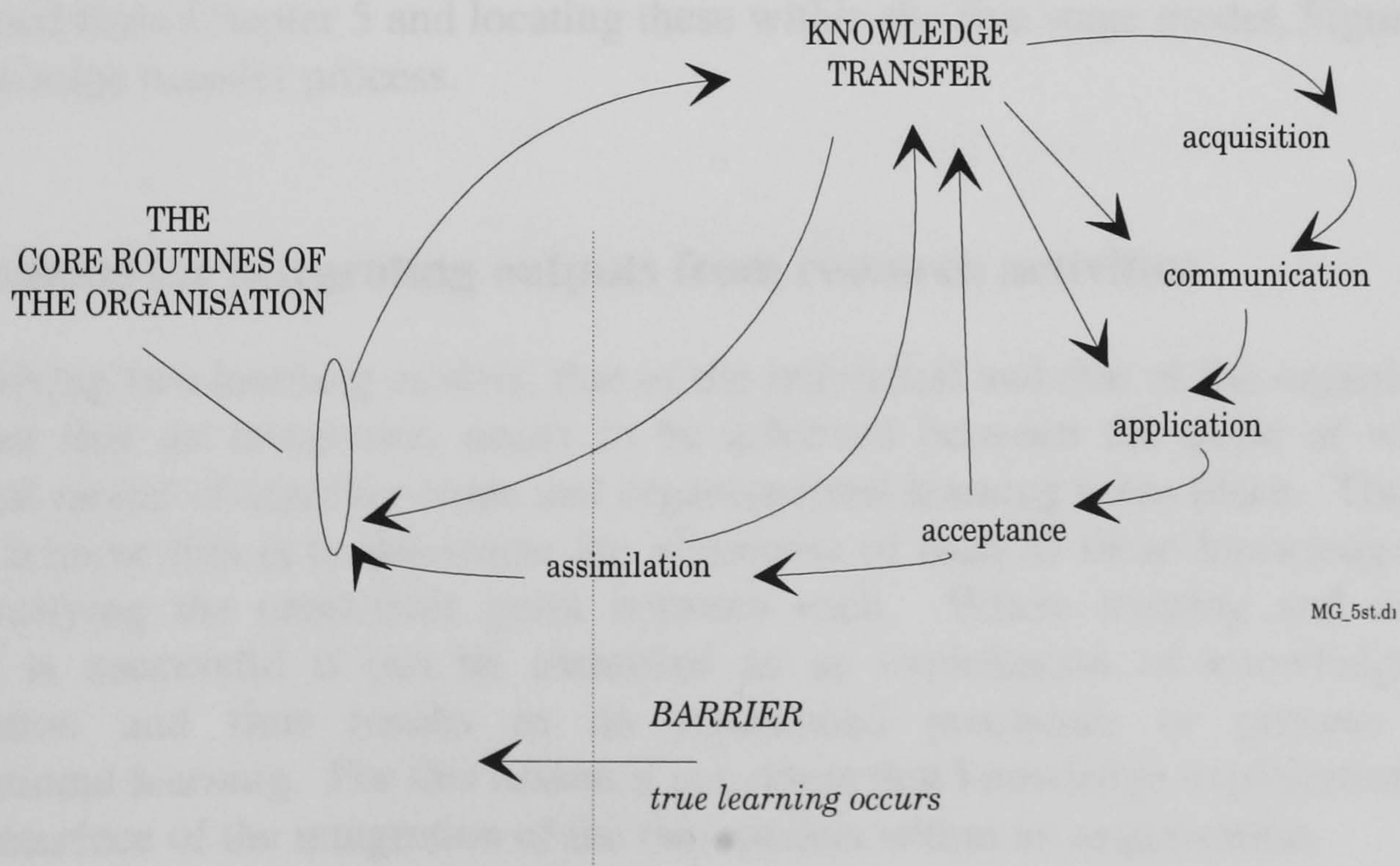


Figure 4.3 Five stage model of knowledge transfer

By moving across the training perspective towards the cumulative knowledge model it was evident that the scope for promoting many training benefits was not always within the control of, or adequately influenced by, those with the best knowledge of the relevant staff.

The model addresses structural change, 'learning', attributes of an organisation as well as the process of organisational learning and therefore provides a mechanism with which to focus questions of cumulative knowledge in an accessible manner.

4.6.2 Managerial issues

Key concerns of the manager were the lack of organisational commitment to organisational cumulative knowledge and the lack of autonomy of managers in order to exploit opportunities for establishing culture change within the firm.

4.6.3 Analysis

A structured analysis of the interview transcript was based on identification of statements referring directly to issues raised in Chapter 5 i.e. organisational hierarchy, managerial autonomy, technical training and development training, learning styles and individual influences upon learning and records of learning (as in the fault finding and diagnosis Module 4 'Recording fault-finding information' - see Appendix C).

4.6.4 Nature of output

The output of the research activity was the substantive findings of managerial issues within knowledge accumulation models. This was achieved by translating the issues determined from Chapter 5 and locating these within the five stage model, Figure 4.3, of the knowledge transfer process.

4.7 Methods for integrating outputs from research activities

By specifying two learning models, that of the individual and that of the organisation, it is evident that an integration needs to be achieved between the point at which the individual model of learning ceases and organisational learning takes place. The method used to achieve this is to determine the alignment of each of these knowledge models and identifying the cross-over point between each. Where training and individual learning is successful it can be identified as an exploitation of knowledge in the organisation and thus results in an established procedure or process change, organisational learning. For this reason it is evident that knowledge exploitation models are the interface of the integration of the two models within an organisation.

4.8 Research activity

The chronological sequence of research activity was issue elicitation, design of elicitation technique, managerial concerns about training failure and managerial concerns about knowledge accumulation. Each of these activities involved at least one key task, with the preliminary elicitation stage including a series of scanning exercises as well as the researcher’s contribution to the fault finding and diagnosis study, see Appendix C.

The series of research activities and their relationship to the overall development of the study is shown in Figure 4.3.

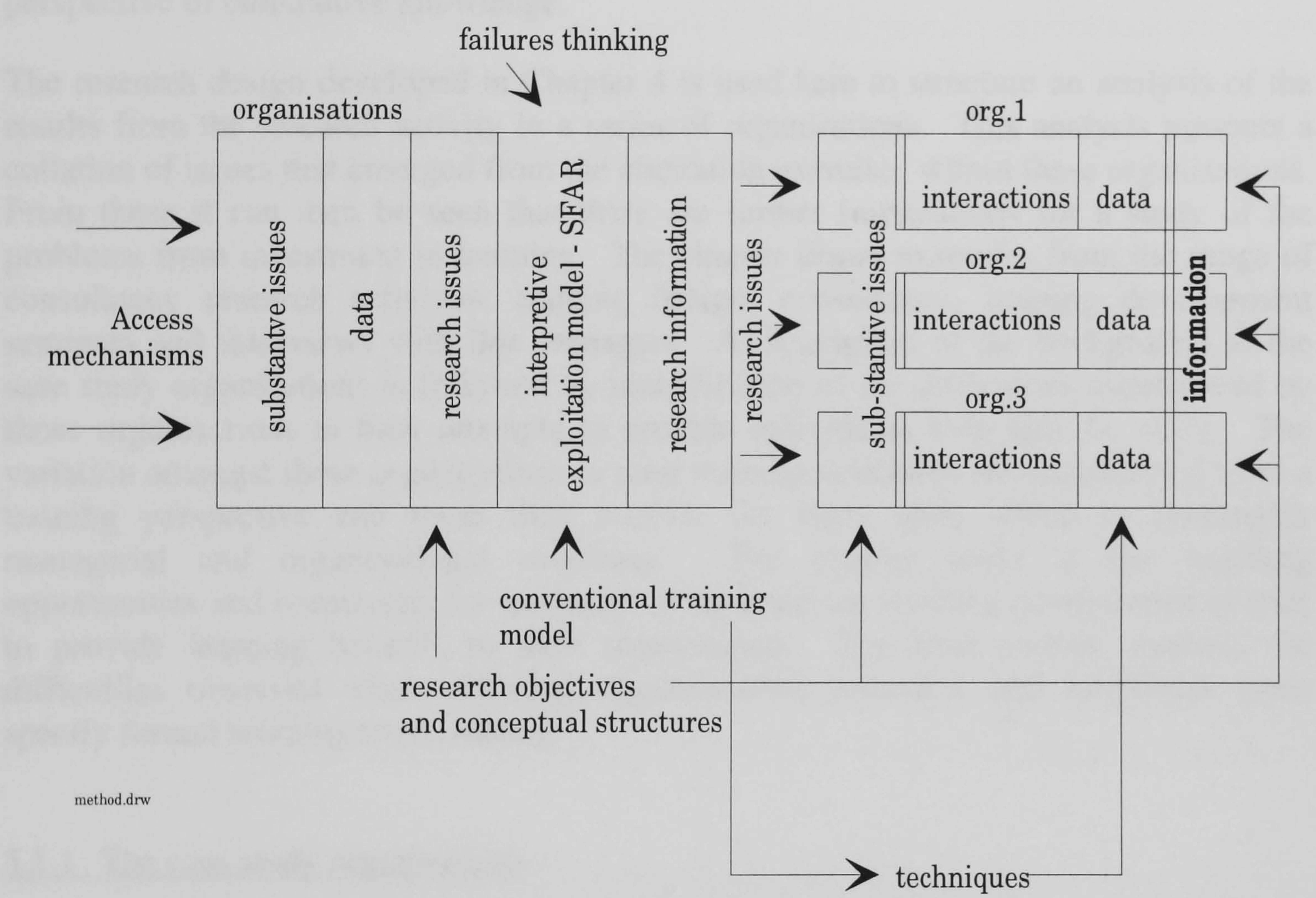


Figure 4.3 Research method

CHAPTER 5

5. Analysis of training issues in organisations

5.1 Introduction and the case study organisations

The purpose of this Chapter is to explore training issues from a number of perspectives. It will exploit data collected from a number of organisations with diverse training processes and a structure will be developed to represent these differences from the perspective of cumulative knowledge.

The research design developed in Chapter 4 is used here to structure an analysis of the results from the research activity in a series of organisations. This analysis presents a collation of issues that emerged from the elicitation exercises within these organisations. From these it can then be seen that there are further implications for a study of the problems from investment in learning. The chapter draws examples from the range of consultancy research activities; training design, consultancy, training development seminars and interviews with line managers. A description of the background to the case study organisations is followed by identification of the difficulties experienced by those organisations in their attempts to provide individuals with specific skills. The variation amongst these organisations in their training structures are summarised from a training perspective and these then provide the basis upon which to investigate managerial and organisational structures. The chapter looks at the resulting opportunities and constraints for managers to structure the working environment of staff to provide learning benefits to their organisation. The final section analyses the difficulties observed when differing organisational structures and functional types specify formal learning from training.

5.1.1 The case study organisations

The organisations studied throughout the research are outlined briefly in the following paragraphs to assist in referencing the relevant training issues. Full descriptions of the research activities developed in each organisation can be found in Appendices B to F.

1. *Building society and financial services* – This organisation is one of the ten largest societies in the UK. Its primary function of services to savers and borrowers developed rapidly with the de-regulation of the UK financial markets in the late 80's. Rapid growth in banking services has placed significant demands on branch managers who are now competing for business with banks as well as their established competitors. The training department is preparing distance learning, text based packages for distribution to senior branch staff in preparation for the launch of new financial services. These products pose a considerable challenge to the established practice of 'off-site' training on day, or week long, courses. The

researcher met staff of the organisation by contributing to an organisational learning seminar at Cranfield, which the Society's personnel director attended.

2. *Energy Utility* – This unit within the case study firm has sole responsibility for the design and development of all distance learning materials produced in-house. The unit functions as a 'cost centre' serving all areas of the energy utility's operations. The distance learning design and development team consists of a manager, assistant manager, senior training designers, training designers, graphic designers and administrators. The unit employs approximately 30 staff in total. The major training issues within the group are; assessing the performance of their training products and justifying the cost savings achieved by distance learning. Staff in the unit contributed to the original CEST (1989) study of technology based training and the researcher has had further contact with the group during discussions on the design of an evaluative study of media types for distance learning. The preliminary development of this study was later discussed with the distance learning unit (DLU) manager and the training development manager at the corporate level.
3. *DIY Retail group* – This organisation is one of the major UK companies in the DIY warehouse sector. As part of a wider retail chain it has considerable investment potential and financial resources. Contact with the researcher was the result of follow-up meetings from the 'organisational learning' seminar at Cranfield where the use of multimedia and its evaluation in the business context were discussed. The major training issues are to estimate how the organisation could ensure that the resources invested in training products are beneficial. Studies of the company's use of training technology have already taken place and recent reports are critical of the amount of equipment 'left on shelves to gather dust'. The relevance of these issues to business development has been discussed with the company's personnel controller, training development manager and senior operations manager during a study design seminar at Cranfield co-ordinated by the researcher.
4. *Telemarketing* – Amongst all of the organisations this firm operates the most rapidly changing training system for providing product information to staff. The company employs trainers working a 24 hour shift system supporting a 365 day operation of product support and advertising. The key training issue for the organisation is the investment in computer based training (CBT) systems to replicate the on-line operation of telephone data systems. These systems are normally used by the telemarketing operators. In addition the organisation believes that future difficulties may arise as company growth continues to require an increasing number operators. This job has few career development opportunities. The firm made contact with the researcher in response to a paper presenting the study interests in the *Training Officer* journal.
5. *Health service administration* – The manager of this part of the organisation also contacted the researcher as a result of the *Training Officer* journal article. This group provided training for hospital administrative staff across the regional health authority. The unit is based in part of a hospital office complex and operates as a

‘cost centre’ with additional subsidy from regional hospital funds to support training. The major training issues in the organisation are the maximisation of benefits from training investment in multimedia and the need to inform administrative managers about training development outcomes. Concern was expressed that few managers are aware of the potential for change from training linked to newly introduced IT systems.

6. *Energy generation components* – This organisation has an established history in ‘heavy engineering’, boiler-making and production of large scale energy generation infrastructure for coal-fired power stations. The rapid change in UK energy policy resulting in a ‘dash for gas’ has significantly reduced demand in this company’s core markets. Technological skills are well developed to manage large scale production but few business opportunities are available for smaller industrial production which can support the massive capital infrastructure and specialised working practices. The researcher made contact with the training manager of this organisation from the knowledge that the training department is unusual in providing training expertise and facilities to neighbouring companies within the region. In particular the company provides training for Training & Enterprise Councils (TECs) as well as local companies in a variety of manufacturing sectors. The major training issue is the maintenance of a cost effective training infrastructure to meet future training needs of the parent company
7. *Electronic point of sale (POS.) equipment servicing* – This small firm is part of a Japanese parent company selling and servicing a wide range of integrated POS equipment. The company’s products include cash registers, equipment for electronic-funds-transfer at point-of-sale (Eftpos), stock control data systems and bespoke software products for clients. Key accounts include petrol station chains, supermarkets and large retail chains. The researcher was working with the organisation as part of a study for the Training Enterprise and Development agency (TEED¹) on the value of fault-finding training within small firms during this contact. The major difficulties faced by field service engineers (FSEs) occur when they are confronted with complex intermittent electronic faults, often in conditions of high stress, e.g. retail managers complaining that ‘*they’re losing income by the second*’.
8. *Public transport operator* – This company was previously part of a local authority managed public transport network. Since privatisation the garage has been structured as a ‘cost centre’ within the regional transport company. Evidence of the organisation’s history remains with the continuation of limited demarcation or work practice. The firm’s extensive network of coach garages now houses a smaller fleet of urban passenger vehicles and the training experiences of vehicle fitters is largely dependent upon earlier apprenticeships through the local authority garage training service. Training is seen as ‘off-the-job’. More recently changes to vehicle design such as the integration of electronic systems with hydraulic or air compression actuators has resulted in service and maintenance problems for the

¹ At this time a government agency within the Employment Department.

vehicle fitters. The researcher was working with the firm in the capacity of consultant in the fault-finding training study for TEED.

9. *Thermo-plastic extrusion manufacturer* – This firm manufactures batches of linear plastic extrusions, light unit covers and similar plastic profile components. The production rates and age of equipment cannot compete with the rapid manufacturing processes of larger producers, thus the firm trades within a low price, low volume niche market. The firm was visited as part of the TEED study and it was evident that difficulties are being experienced in accommodating the market demand for low price and quick response alongside industry changes in quality management and registration standards. The firm has applied for BS.5750² and is therefore required to achieve process control standards providing training to achieve this level of performance. Communication between the working shifts and shift operators is poor, particularly on production issues, and the consultancy exercise addressed some of these concerns. The major learning issues is to establish effective training even though the firm does not have experience of working closely with its line operating staff.
10. *Commission for Local Administration* – This organisation is the administrative and investigative function of the *Local Ombudsman* which is a ‘non-governmental organisation’ (NGO) with financial support from and senior appointments made by the government. The researcher was put in contact with the Director and the CLA staff training new investigators by the research Supervisor who was aware that a number of training issues were being reviewed. The resulting preparatory information, meetings and development of a training design formed the major part of involvement with this organisation. The central training issues are the development of a comprehensive professional training programme that can assist the development of the service to meet recent demands arising from office relocation, service expansion and a significant employment increase in the number of investigators. The changes in staff levels have direct implications for the decoding of tacit knowledge into a formal training programme and establishing procedures for defining performance standards.
11. *Civil engineering design company* – This medium sized firm specialises in roadways, bridges and tunnels. The researcher contacted the senior project manager responsible for training as he had previously expressed interest in comparing the differences between his firm, a ‘knowledge based’ organisation, and learning models developed from other sectors. The researcher presented a ‘training failures model’ and used this as the basis for exploration of the training development issues faced by the firm. The key training difficulty in the firm is in keeping experienced engineering staff when business down-turns force redundancies. A further training issue is the pressures resulting from the need for institutional

² The 1987 British Standard in Quality Systems (ISO 9001)

qualifications³ and the development of specific technical skills which cause resource problems e.g. CAD training.

12. *Information Systems development team manager* – This Information System (IS) specialist manages a team of IS staff who are responsible for the operation and management of changes to IS infrastructure within the company. The company, a major energy utility, has a large number of sub-divisions and business operations that are hierarchically structured and regionally divided. Communication system development requirements within the company are resulting in further training demands upon staff. This requirement to rapidly update staff with technical knowledge of new systems is a key issue. The manager is interested in the training and HRD issues that large organisations face, therefore, the interview was used to assist in recording the manager's views of these issues.

Each of the training issues that arise from the work with these organisation are discussed in the following section which is sub-divided into themes.

Code	Organisation type	Staff referred to within the organisation
1	Building society & financial services	Sales & office staff throughout
2	Energy utility - distance learning unit	Technical & sales staff throughout the region
3	DIY Retail group	Shop-floor retail staff
4	Telemarketing	Telephone sales operators
5	Health service administration	Secretarial & administrative staff
6	Energy generation components	Engineering apprentices
7	Electronic P.O.S. equipment servicing	Field service engineers
8	Public transport operator	Vehicle fitters and service operatives
9	Thermo-plastic extrusion manufacturer	Process line operatives
10	CLA - Local Ombudsman	Trainee investigators in the central UK office
11	Civil engineering design consultants	Civil engineers working for ICE membership
12	IS development team for energy utility	Information system managers

Figure 5.1 Summary table of the case study companies

5.2 Knowledge requirements and training characteristics

From the early discussions and observations within companies and the INTA study (CEST 1989) it appears that characteristic difficulties are experienced by organisations when expecting to benefit from training under certain conditions. Each organisation's skill and knowledge requirements, alongside the way in which this formal learning experience is provided, is discussed in this section. Reference is made to the problems and features that are identified to be of significance to managers in each organisation.

These issues are divided into the themes outlined in Chapter 4 in order to assist in the structure of the analysis:

³ Membership of the Institution of Civil Engineers (MICE)

- type of knowledge - 5.2.1;
- training imperatives - 5.2.2;
- organisational structures - 5.2.3;

Figure 5.1 provides an index to the organisations investigated. These form the basis of the case study activity with each firm providing evidence of at least one of the training issues discussed. Further details of these organisations and evidence of the research activity can be found in Appendices B to F.

5.2.1 Knowledge type

The term knowledge is used here to define the hierarchy of learning concepts upon which performance requirements are based. An initial level of educational achievement is assumed amongst employees and unless otherwise stated this is taken to be; basic arithmetic, a reading age of approximately 12 years and an ability to construct simple written grammar.

The difficulties experienced for specific knowledge typologies vary between organisations. Within the case organisations variations range from requirements impinging on extensive resource demands for learning experiences resulting in difficulties for the firm to retain staff. Knowledge and skill demands range from an understanding of repetitive skill needs to demands for an understanding of theories at more conceptual levels.

Four key issues relate to issues of knowledge acquisition are evident in the case study investigations. These are presented below and further discussed in Sections 5.2.1.1 to 5.2.1.4:

- knowledge of ones own learning abilities or ‘learning to learn’, the personal recognition of learning ability by trainees;
- translation of implicit understandings, beliefs to explicit knowledge statements;
- knowledge forms that demand significant infrastructural investment for their delivery and experience, and;
- critical and yet basic knowledge, of significance to the firm, as opposed to its pedagogic complexity or difficulty in learning.

5.2.1.1 Affective and attitudinal knowledge - ‘Learning to learn’

Two organisations direct strong efforts to overcome low confidence levels in staff as a central part of their learning provision. The DIY retail group (3) and the telemarketing firm (4) place clear emphasis on the encouragement of learning development amongst their staff and recognise that the greatest ‘blocks’ to achievement of performance are the previous learning experiences of their staff. The majority of operational staff have not achieved in early education with very few reaching further or higher education. Therefore the provision of training as part of employment faces staff with a direct challenge to their confidence. The working procedures normally require confident and friendly communication with customers and clients. These organisations found staff

selection important to identify individuals at ease with this behaviour. Training was used to increase self confidence amongst staff and to link the learning culture to specific work tasks and performance targets.

A key problem for these organisations was the rapid staff turnover. Once confidence was achieved, workers who were able and inspired to learn no longer found the work place a challenge. These staff then moved on or became bored with the work environment. The low financial incentives offered by the firm are insufficient to overcome the lack of interest of staff who were familiar with routines. Alternative training strategies were unable to inspire greater interest in the limited routines of this sector of retail.

A similar process exists within the CLA (10) where more highly qualified and well educated staff performed an investigative role demanding a high level of skill and knowledge, but with limited scope for development. This feature was recognised within the organisation and staff were encouraged to take positive actions to determine their departure from the organisation. This is particularly the case where the limitations of applying investigative skills are perceived to reduce career prospects. This problem is not an uncommon feature for knowledge based industries in some sectors, such as routine laboratory services or some public service providers, but it is unusual for an organisation to establish an explicit policy to manage this circumstance.

5.2.1.2 Translation of implicit knowledge to explicit definitions

Another difficulty arising from knowledge type was observed in the CLA (10). This is the formalisation of an implicit understanding about professional conduct into knowledge forms that can be provided to new trainees. The rapid increase in numbers of investigators requires a more formal training system as well as performance criteria with which to establish standards of service and achievement. The exercise in knowledge translation required a comprehensive job analysis as well as identifying performance targets for appraisal and establishing minimum levels with which to determine successful completion of probationary periods.

It was clear that the expansion of this organisation demanded a translation from implicit to explicit knowledge which in itself is a considerable undertaking for any staff group ordinarily focused as a small professional team.

The same issue of translating implicit understandings to explicit knowledge forms was a central part of the exercise in fault-finding and diagnosis training. Here, companies included in this study (7, 8, & 9) all faced varying degrees of difficulty in adapting to the consequences of explicit knowledge forms that were previously personal and individually based. Interestingly, staff in each of these organisations were aware of those individuals who were most successful at applying implicit knowledge forms. However, unlike the CLA, few of these firms accepted that this translation stage could take place and be communicated to others.

5.2.1.3 Infrastructural investment in knowledge acquisition

The large scale engineering organisation (6) is a major skills training providers in the Midlands region. The extensive range of equipment required to develop advanced construction skills is based on a knowledge of materials as well as good 'hand & eye co-ordination'. These skills are mainly required for 'coded' welding and mechanical fitting. Significant infrastructural investments are needed to provide materials for this skill based knowledge.

It is evident that certain combinations of critical judgement and knowledge can only be acquired by high infrastructural investments in training. A failure to invest can result in significant liability or risk to the organisation's assets or operations e.g. mechanical failure of welded joints operating under high pressures, or the failure of structural metal sections. These capital investments in training turn shift the problems of training provision towards questions of cost efficient training delivery e.g. the costs of updating skills, recovery of investment, cost-sharing and inflexibility to externalising training.

The greatest investments observed in technology based training were those in the DIY retail warehouse sector (3). Here £2M+ had been spent on the introduction of multimedia equipment to meet initial training requirements. Knowledge requirements were focused on the procedural and routine performance of tasks such as 'customer care training' and concern was evident that training products were not being used any where near to the extent originally intended.

In contrast to the difficulties experienced by the DIY retail group (3), the major problems that the civil engineering firm (11) experienced were in accessing the extensive expertise within the firm and ensuring that this cumulative knowledge was not lost as people left the organisation.

5.2.1.4 The importance or criticality of simple knowledge

For certain organisations inappropriate actions of staff have the potential to incur serious risk or liabilities. These firms were concerned with identifying areas of risk and specifying knowledge requirements. The Building society (1), Telemarketing group (4) and the Health service administration trainers (5) were all concerned with the maintenance of accurate services despite the limited or relatively low complexity of the knowledge that was being used. This phenomena is common to a number of organisations where repetition of high level skills such as laboratory testing procedures cause problems in providing variety in their procedures whilst demanding high standards of accuracy. Under these conditions human error is a high risk.

In the particular case of the building society the exposure of the organisation and their clients to high financial liabilities was a concern when new financial services such as investment portfolios and share trading were introduced. In these circumstances routine guidance for 'form filling' had to be supplemented with wider knowledge of the financial risk associated with each transaction.

5.2.2 Training imperatives

From the case study visits the motivations or reasoning behind training investments can be classified within 3 broad categories:

- Training for ‘core activities’;
- Training for change;
- Training for personal development;

It is interesting to observe the nature of problems that arise when attempts are made to achieve benefits from investment in training under each of these categories. These are discussed in Sections 5.2.2.1 to 5.2.2.3.

5.2.2.1 Training for ‘core activities’

The term ‘core activities’ is used here to describe the normal routine functions of the organisation, referred to by Gilbert (1995) as ‘instrumental knowledge’.

To a greater or lesser extent all the organisations use formal learning methods to support the routine procedures of their operations. From these examples the civil engineering group (11) had the least frequent demands for formal training with Health & Safety being the sole example of necessary qualification and accreditation for all staff undertaking work such as on-site specifications. The civil engineering firm relied upon supervision methods by project managers on the basis that having completed an engineering degree, tasks of increasing complexity and responsibility could be progressively introduced.

A number of firms use formal training selectively to support their core activities and in many cases these were more frequent introductory or orientation courses for new staff (1 - 10, 12). Training as an introductory mechanism was undertaken extensively in technically driven sectors with apprenticeship or probationary periods ranging from 6 months (2, 7) to 3 years (6). Those organisations specifying graduate selection commonly identified a 6-12 month period of induction training to locate individuals within ‘core routines’ (1, 2, 10, 12).

In a few organisations formal training was limited and formed only a small part of joining the group (9, 10). However, external pressures on these particular organisations have resulted in the introduction of training for ‘routine’ activities and these methods are now established. This highlights a distinction between training intended to initiate change and that which supports the consequences of a completed change process.

5.2.2.2 Training for change

Few organisations successfully introduced training to establish change processes. The DIY retail group (3), Health service admin. (5), POS equipment (7), Public transport (8), plastic extrusion (9) and IS development (12) had all attempted to use staff training

to establish organisational change e.g. change of job functions, increasing responsibilities, development of new skill areas. The IS group (12) could offer no evidence of successful culture change from a number of 're-packaged' team briefing initiatives. Those companies involved in the fault-finding study (see Appendix C) showed signs of considerable difficulty wherever changed working practices were required to change beyond those solely of the individual⁴. It was evident that whilst training was a potentially useful technology transfer channel (see Chapter 3, Craig and Allen's 'list of channels'), problems were encountered when organisational change was a pre-requisite for the use of knowledge from training.

5.2.2.3 Training for personal development

In a few cases training is employed by the organisation solely for the personal development of staff. In the energy utility (2, 12) resources and funding were made available for staff to gain knowledge in areas not directly related to their role or job function. This organisation expected 'a case' to be made for supporting development but the criteria for approval was broad based and supportive of a wide range of proposals. The firm was well resourced to provide this level of support and did not show concern to direct the exploitation of learning from this investment. Indeed evidence showed that there was often no relationship established by the company between prior learning and expectation of future performance from this company's staff.

In other cases organisations accepted that the form of training they offered increased career prospects for their staff, particularly early on in their working lives (1, 4, 6, 8, 11). In these examples personal development was accepted as a necessary 'cost' to the organisation with a number of firms lowering income during this period to ensure that investment in productivity is partially recovered should staff leave once trained (1, 6, 8, 11). The exception to this was in the telemarketing firm (4). Here low levels of confidence are reduced through recognition of success in all forms of learning. More interestingly in the CLA (10) the senior manager recognised the limitation of career scope for experienced investigators and supported training in the form of personal development as a means of developing and retaining staff at the outset and then encouraging them to plan and support their career moves at a later stage. By developing and retaining staff for a period whilst their interest was captured and their contribution to the organisation was enthusiastic the organisation supported their development and agreed individual plans to leave the organisation for other areas of employment. This was unique as a knowledge management strategy amongst the organisations. The managerial initiative benefited the organisation by improving the career path of individuals within an organisation which might otherwise suffer from individuals frustrated by the lack of career opportunities.

⁴ For further evidence of this see Craig 1992.

5.2.3 Organisational structures

A number of organisational attributes influence the outcomes of investment in learning. The scale, nature of function, managerial style, history of the organisation and its anticipated future are all commonly acknowledged to be of influence. However as this study focuses on the elicitation of issues it is relevant to note these differences amongst the groups visited (see Figure 5.2 & Figure 5.3).

Code	Organisation type	Hierarchical structure		Profit / non-profit		
		Flat	Tall	non-profit	manufact-uring	commer-cial
1	Building society & financial services					
2	Energy utility - distance learning unit					
3	DIY Retail group					
4	Telemarketing					
5	Health service administration					
6	Energy generation components					
7	Electronic P.O.S. equipment servicing					
8	Public transport operator					
9	Thermo-plastic extrusion manufacturer					
10	CLA - Local Ombudsman					
11	Civil engineering design consultants					
12	IS development team for energy utility					

Figure 5.2 Table 1 of attributes - organisational structure

attribute		staff in case study section (total staff in organisation)				Organisational history (anticipated future)				Managerial autonomy		Organisational autonomy		
Code	Organisation type	10 - 100	100 - 1,000	1,000 - 50,000	50,000 - 100,00	Rapid / stepped reduction	Progressive reduction	Stable	Progressive growth	Rapid / stepped growth	High	Low	High	Low
1	Building society & financial services		1	1					1	1				1
2	Energy utility - distance learning unit	1			1		1	1				1		1
3	DIY Retail group	1		1					1	1		1		1
4	Telemarketing		1	1						1	1		1	
5	Health service administration		1	1				1				1		1
6	Energy generation components		1	1		1	1	1				1		
7	Electronic P.O.S. equipment servicing	1		1				1	1			1		
8	Public transport operator	1		1			1					1		1
9	Thermo-plastic extrusion manufacturer	1		1		1						1		
10	CLA - Local Ombudsman	1						1		1				1
11	Civil engineering design consultants	1	1				1	1				1		
12	IS development team for energy utility	1			1		1					1		1

Figure 5.3 Table 2 of attributes - organisational structure

Figure 5.2 and Figure 5.3 present a number of the key issues related to organisational structure within the case study organisations:

- ‘Flat’ or tall hierarchical structure of organisation;
- Profit / non-profit / Manufacturing / commercial;
- Size of organisation;
- History;
- Managerial autonomy;
- Organisational autonomy from its associated companies;

5.3 Discussion

Training experience is often a pre-requisite for staff joining an organisation. In certain cases external factors such as institutional exams required that staff to complete specific training courses whether or not this is seen to benefit the organisation in the short term. In only two cases (4) and (10) were there line managers who could use training and learning resources completely at their discretion. These were able to determine the extent of training for each individual, should they wish to do so, and to specify new forms of training if they were felt this to be necessary.

Interestingly these organisations (4) and (10) are the only two that face career development problems for their staff and are able to recognise this explicitly. Firm (4) use low level instrumental knowledge as a central part of its function with no role for developmental knowledge to be used by staff at this level. The organisation has high organisational autonomy and is able to determine its development within the section of this market. However it has no diversity in the performance of its functions. In parallel with this firm (10) uses high level instrumental knowledge taking considerable time to develop. Again there was no opportunity to apply developmental knowledge within this organisation and whilst the ‘flat’ organisational structure enhances managerial autonomy, the limitations in organisational hierarchy and functional diversity results in limited scope for the exploitation of developmental skills.

The term functional type is used here to describe the nature of business operations that characterise the organisation. From a training perspective three broad types are defined; service, knowledge based and manufacturing. Service provision is used here to include organisations (1 - 5, 7 - 8, & 12).

This summary of these organisations is a basis for interpreting the investigation of managers’ perceptions of design, exploitation and assimilation in Chapters 6, 7 and 8. In addition it provides the context for the synthesis of key dimensions of knowledge type, structure and process in Chapter 9.

CHAPTER 6

6. Training design issues from a managerial perspective

6.1 Introduction

Chapter 5 elicits a variety of issues from a cross-section of organisations. In this chapter the distinction made by Gilbert's (1995) classification of 'instrumental' and 'developmental' knowledge provides an insight into the nature of organisational difficulties from differing training imperatives where these issues of learning exist. The organisational benefits from routine skill based training are often evident and in these cases organisations are able to monitor their change in performance. However, for training intended to contribute to changing the organisational form frequent difficulties occur and the benefits are harder to identify.

The distinction between instrumental (I) and developmental (D) knowledge is used here with reference to differing organisational forms. Knowledge gain in Chapter 3 is discussed as the cumulative knowledge of the organisation. It is however more difficult to see what these terms mean at an individual level. Indeed it seems consistent that 'I' and 'D' knowledge forms cannot be discriminated between without an organisational context. This observation is different from noting the scope or complexity of knowledge forms for the individual. For example the level of instrumental knowledge used by civil engineers or staff in the CLA, commonly high level technical abilities or skills, is more advanced than that required for telemarketing or plastics profile manufacturing. The difficulty that arises is how organisations distinguish between knowledge forms that contribute to organisational change.

It appears that there are few examples where individuals managing an organisation are able, equipped or empowered to ensure that specific forms of knowledge are recognised and that the organisational context is able to benefit or be changed. The issue of organisational types raised in Chapter 5 also reflects different stages within the process of specifying, designing, delivering and using knowledge from training. By identifying the scope of issues it is then helpful if the nature of problems at each stage in the process can be understood better.

The training literature, referred to in Chapter 2, describes the process of identifying knowledge need, specification, delivery and evaluation as a cycle of training design acquisition and exploitation. Whereas the organisational view of this process is one of design, exploitation and assimilation into the organisation, the 'cumulative' characteristics of knowledge.

The mis-match in the perspective of this process highlights questions that relate to the evaluation of learning benefits e.g. should learning be evaluated at the level of individual 'acquisition'? How well has individual learning taken place and should learning be evaluated at the organisational level of 'assimilation'. Further, how effectively is learning used when 'in-place'?

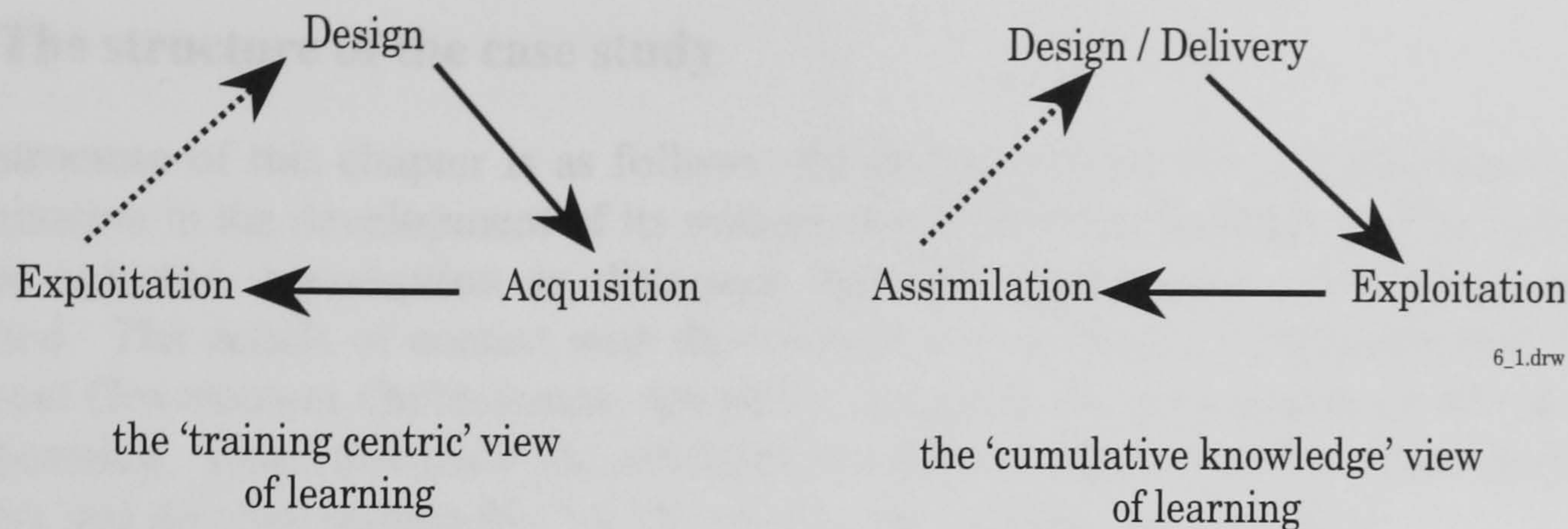


Figure 6.1 Training centric and cumulative knowledge views of learning

The terms 'organisation' and 'individual' are used to make distinctions between the learner at one level and the person specifying training at the other. However each is an individual in their own right and it is important to recognise that if improvements in cumulative knowledge gains are to be achieved they can only take place by the action of individuals.

For this reason it is useful to look at the role and decisions taken by the individual manager closest to the 'learner'. One would expect this person to have insights as to how to specify and identify knowledge requirements that are believed to be of value. An interesting point in the training process to study this is where the knowledge processes from both perspectives should be congruent, i.e. knowledge specification and form 'design and delivery', Figure 6.1. However, the evidence from organisations suggests that this congruence is often unlikely to arise.

This element of the research activity looks in depth at what is taken into account by a manager of a firm at the 'knowledge based' end of the organisational spectrum. By studying the design process, insights can be gained as to what needs to be considered by managers when attempting to structure performance in an organisation through learning. Where knowledge requirements are low and instrumental it seems possible for organisations to define appropriate learning experiences. However, it is likely to be more difficult for training staff to match curriculum and assessment planning without a structured input from managerial levels in an organisation where instrumental knowledge levels are high or developmental knowledge is required. This highlights the need to identify and translate defined managerial needs into training needs.

In this chapter a research activity is presented that provides an improved understanding of the opportunities and problems that arise when a training curriculum is designed to ensure compatibility between the organisation and the training function. In this case the organisational changes that result in a shift from the tradition of "sitting with Nellie¹" to the need for a planned programme, also has consequences for the specification of job and training performance indicators. In this case performance indicators were needed to assess the appropriateness of the training provision and to guide trainees through a route to professional standards in the CLA.

¹The traditional training practice of guiding individual trainees through their early work-place learning by placing them alongside an experienced and competent worker.

6.2 The structure of the case study

The structure of this chapter is as follows: firstly the reasons for collaborating with an organisation in the development of its training curriculum are explained. The suitability of the selected organisation is discussed and the organisation's functional role is outlined. The details of contact with the Commission for Local Administration (CLA), or Local Government Ombudsmen, are given alongside the preparation involved in the collaboration. From this point the job function of the trainees, and the issues facing the trainers and director responsible for structuring the training are explained.

By investigating the mechanisms for specifying training to match an organisation's context, it is proposed that the potential for enhancing performance of that organisation can be understood better. This issue is considered through a research activity with the CLA. By working closely with this organisation and developing a procedure to link the training and assessment of investigators to its organisational context, a number of implications for curriculum design are revealed.

The researcher was requested to provide the training staff with feedback on the mechanisms suggested for formalising the training programme. This is explained and supported with evidence of the actions undertaken in the organisation and the measures taken to maintain the programme. In conclusion the agenda of issues concerned with establishing appropriate organisational context to benefit from learning are summarised.

6.3 Designing a training curriculum in the organisational context

In order to understand the difficulties faced by staff attempting to integrate training within routine procedures, it is evident that it is necessary to work closely with an organisation in the formulation of its training curriculum. To complete this as part of the research and yet be close enough to training development it is clear that the research activity is most effective if it focuses on work in progress in a collaborative or consultative role. By working alongside trainers in such a role it is possible to gain a better understanding of the issues faced when formulating the training curriculum. Such an organisation needs to be large enough to be concerned about training yet small enough to be closely aware of training needs. Therefore it was estimated that an organisation with a need for a training curriculum devised for between 15 and 50 staff is appropriate. This number reflects a need for adequate planning, as opposed to the tradition of 'sitting by Nellie' which does not demand a managerial contribution and therefore is not viable with this number. Also this number is not so large that direct contact is lost with the trainers or trainees.

For some time the project supervisor has maintained good contact with a director of one of the CLA regions. On occasions training and development has been discussed and as a consequence of a regional office expansion, resulting in the relocation of a significant element of the operations, an increase in the numbers of investigators was required. This increase outweighed the capacity of the organisation to continue to train its investigators through one-to-one professional coaching which had previously operated.

The issue of professional staff development and assessment was discussed in more detail and the Director provided the researcher with background to the CLA and the nature of its operation. The job of the investigator is outlined in more detail in Section 6.4, however, it is the issues faced in formalising this training which are the concern of the research activity.

6.4 The Commission for Local Administration (CLA)

Details of the background and role of the CLA are presented in Appendix D. However a summary of purpose, jurisdiction and objectives are provided below.

The purpose of the Commission is...

“to provide independent, impartial and prompt investigation and resolution of complaints of injustice caused through maladministration by the authorities listed overleaf and to promote fair and effective government.” (The Local Government Ombudsmen, 1993/94:4)

And the authorities within the Ombudsmen's jurisdiction are:

- *District, borough, city and county councils (but not town or parish councils).*
- *The Commission for New Towns and new town development corporations (housing matters only).*
- *Urban development corporations (town and country planning matters only).*
- *Housing action trusts;*
- *Police authorities (though the CLA may not investigate complaints about individual police officers)*
- *Fire authorities.*
- *Any joint board of local authorities, including the National Park boards.*
- *The Norfolk and Suffolk Broads Authority.*
- *The National Rivers Authority (flood defence and land drainage matters only).*
- *Education appeals committees. (ibid.: 5)*

With their supporting objectives being:

- *To encourage authorities to develop and publicise their own procedures for the fair settlement of complaints and to settle as many as possible locally.*
- *To encourage the local settlement of complaints made to the Local Government Ombusman.*
- *To publicise the services of the Local Government Ombusman system as widely as possible and to advise people on how to make a complaint.*
- *To secure remedies quickly for those whose complaints are justified.*

- *To issue guidance on good administrative practice to local authorities and other relevant bodies.*
- *To offer guidance to people whose complaints are outside the jurisdiction of the Local Government Ombudsmen. (op. cit.)*
- *To support the work of other ombudsmen in the public and private sectors.*

The Commission employs investigators and support staff, grouped into the three regional teams, each working with one Ombudsman, and each headed (under the Local Ombudsman) by a director.

The role of the investigator is central to the function of the Commission. From the time that a complaint is received and the case is allocated to an investigator it is their job to collect information related to the case and if necessary to visit the complainant and the local authority. The role of the investigator demands subject knowledge, investigative skills, knowledge of local government administration and a clear understanding of the role and ethos of the Commission.

6.4.1 The training issue and consultation process

Four areas of the investigator's job function can be identified that are key to their professional competence: subject knowledge of local authority structures and procedures, fieldwork skill, knowledge of the investigator's function in the Ombudsman procedures, and the professional ethos of the organisation. The central function of the investigator is to investigate complaints and prepare reports for the organisation. Once these reports are complete, the actions of the CLA are reported to the complainant and council. Where appropriate the complaint is either accepted and the actions reported to the complainant or if the case is outside the remit of the CLA then the complainant is advised with reasons given. The essential features of the job are to examine complaints, analyse documents, carry out interviews, write reports and to make recommendations. Considerable skills are required in explaining to a complainant why the Local Government Ombudsman was not able to investigate a complaint.

When discussing training issues the CLA was concerned that as a consequence of the rapid increase in the number of investigators the one-to-one provision which had operated effectively in the past may be lost through expansion of the training programme without enough experienced investigators, 'Nellies', to guide new trainees. Not only had there been a rapid increase in the number of investigators but the increase in complaints and the government interest in the Commission's role in supporting good administrative practices meant that the scale of the CLA's role was likely to increase further. This had consequences for formalising training in the longer term.

The first discussions were between one of the Directors and the project supervisor. The Director then provided details of the CLA's operation and the plans for training investigators which included the appointment of two experienced senior investigators as training developers. The broad objectives of the programme were:

- a). to ensure that new recruits received a sound grounding in the Commissions work practices and procedures;
- b). to ensure that there was a programme for acquiring the relevant subject and operational knowledge, either in whole or in part;
- c). to ensure that fieldwork techniques were acquired;
- d). to ensure that within a 12 week time scale, by the end of the course, investigators would be able to put Stage I terminations² direct to the Local Ombudsman as well as investigate solo in the field.

The educational background of the investigators is pertinent to the way in which the training provision is planned. The majority of investigators are either graduates and or professionally qualified, and many have previous experience of employment in local authorities. The staff learning expertise is considerable and their interests reflect the pursuit of each individual's career interests. The design of the training programme needs to acknowledge the trainees' awareness to the consequences for their personal development and provide a 'route' for this development. A key concern is to structure the curriculum and assessment of new recruits overall to provide a workable assessment mechanism with which to inform about weaknesses and the progress in improvement throughout the training. The assessment is scheduled at one month, three months, six months, twelve months and two years with one usually coinciding with the annual appraisal available to all staff. The three months assessment at the end of the course is of importance as it coincides with the expiration of a trainee's probation.

6.5 Designing a training programme

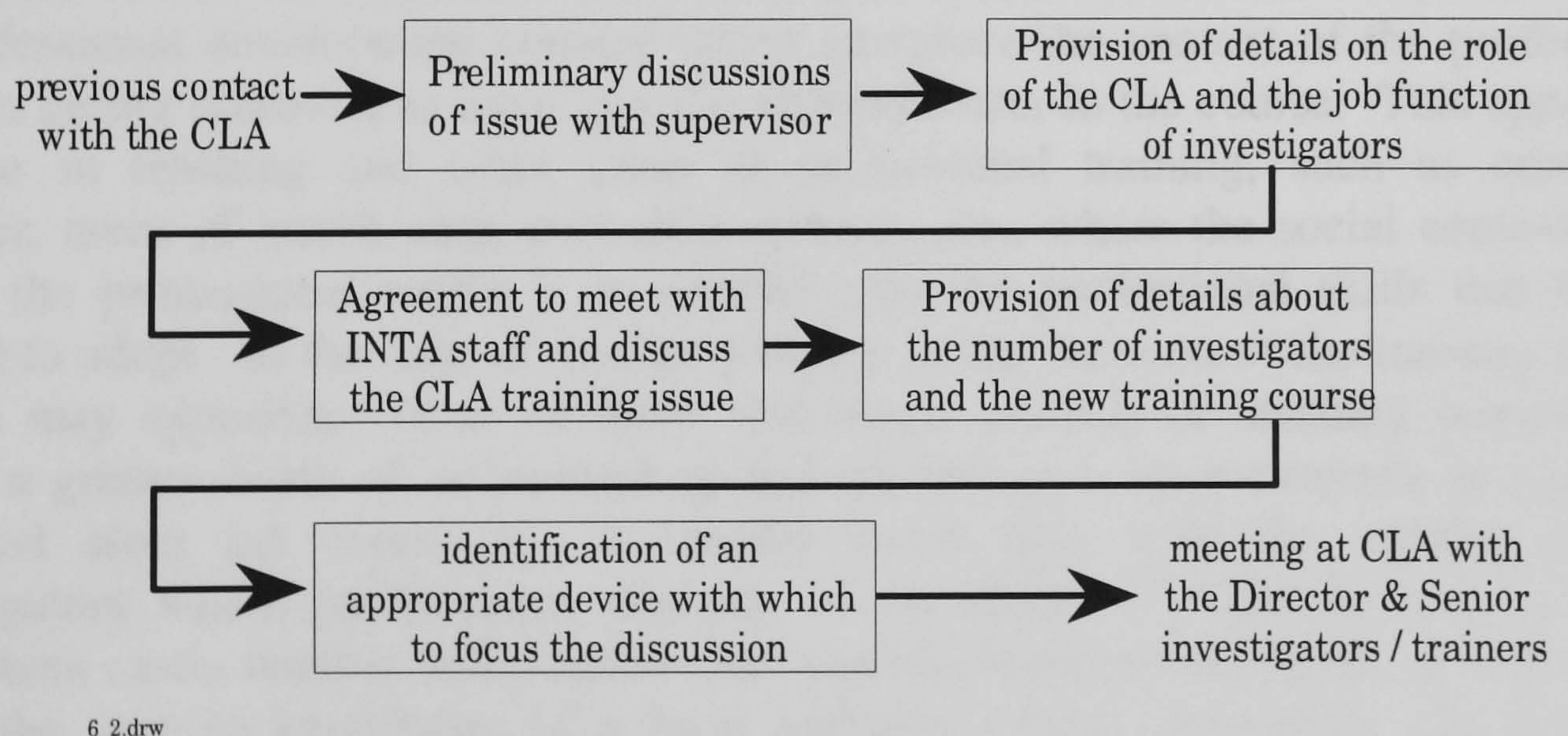


Figure 6.2 Preparation for planning meeting with the CLA

² Stage I terminations define the closure of an investigation by the CLA when the investigator identifies the complaint to be outside the remit of the Commission.

The sequence of early consultation with the CLA is shown in Figure 6.2. The Director provided full details of the background to the organisation with details of the training programme and general level of qualifications of trainee investigators. In anticipation of the meeting the researcher identified a professional development model, commonly used to articulate the curriculum development used for other professional groups such as trainee teachers. It was believed that such a model could provide a useful illustration of the means by which, in a knowledge based organisation, substantive and contextual knowledge could be represented alongside appropriate contexts. It was clear that, by making a mechanism available upon which to base the discussion, the issue of the 'process of learning' could be focused upon. The model of professional development offered by the researcher is shown in Figure 6.3

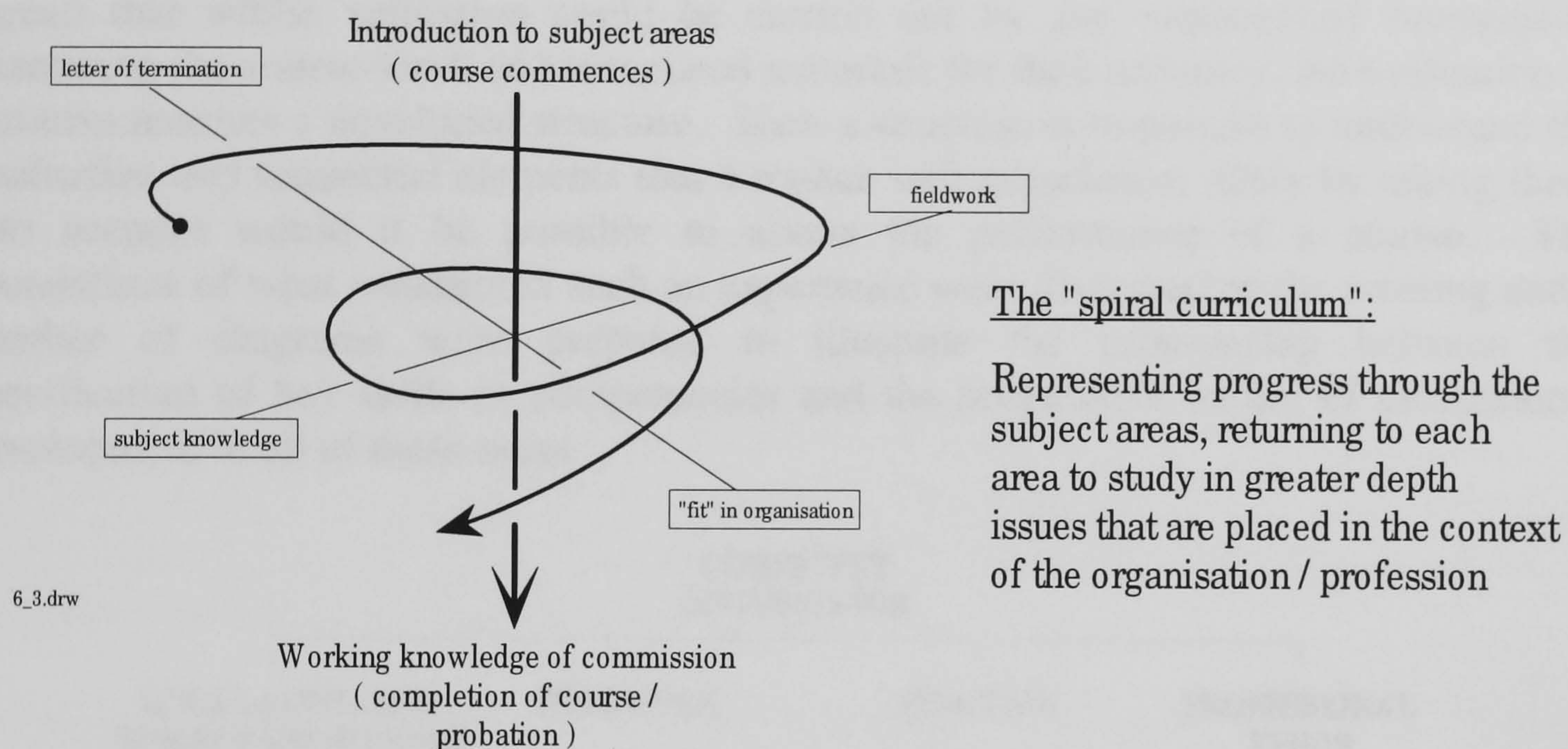


Figure 6.3 The spiral curriculum of professional development

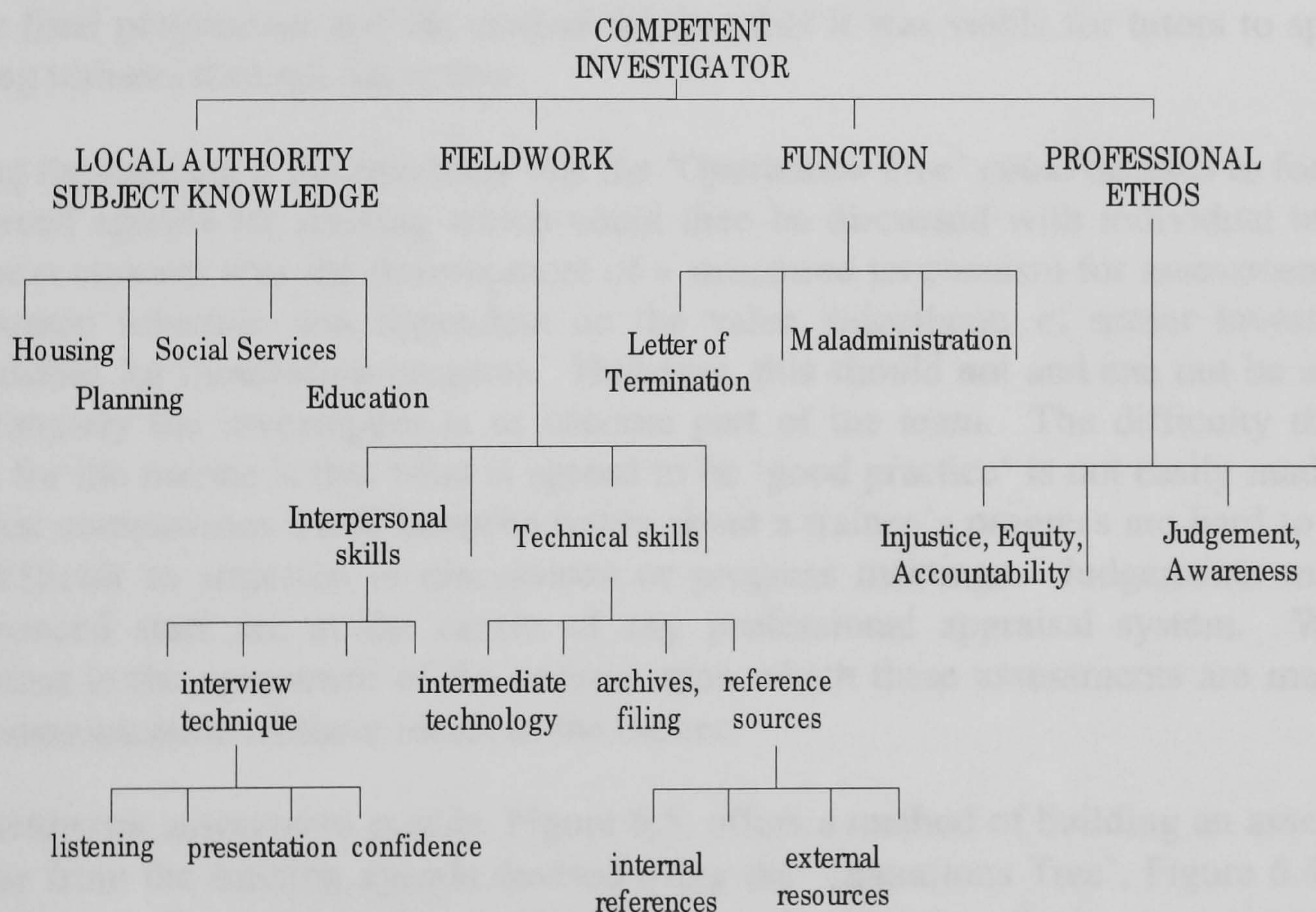
The spiral curriculum diagram is often used as an illustrative model to explain the value of professional development courses which introduce the context of the profession to trainees before returning to more specific elements later in the course. This approach is familiar in teaching and other areas of professional training, such as community services, areas of health care, probation services etc., where the social context within which the professional works is in parallel with the professional skills that they are trained to adopt. In the case of teacher training, in the duration of the training course a trainee may experience three or more 'fieldwork' periods of teaching practice from which a greater depth of understanding and performance improvements in social and technical areas are expected. A parallel exists here with the training of CLA investigators where performance depends on an ability to work in social contexts, understand cases, retrieve information from professionals and the public and relate facts about the case to knowledge of a local authority's legal obligations and procedural responsibilities.

After consideration of background details about the training provided it was agreed that what was previously offered as a training experience in the CLA was extremely valuable and the next stage should build on the experience of the most experienced investigators. In developing a larger scale programme it was clear that a mechanism needed to be designed to translate the agreement between senior management and senior investigators

on what was good practice into a formal system of recognition. For this reason the meeting at the CLA quickly focused on the attributes of the organisation and how these might be represented in an assessment system for use in the appraisal of trainees and the evaluation of the course curriculum.

6.5.1 Output of discussion with the organisation - The Training of Investigators:

During the meeting it became clear that a necessary distinction in the language of training should be made between 'validation', being the subject or accuracy of the course content and 'evaluation', being the value of the training programme either the immediate or longer term, to the whole organisation and individual investigators. It was agreed that whilst validation could be carried out by any experienced investigator examining the course-work and associated materials for their accuracy, the evaluation of a course requires a developed structure. Such a structure is important to understand the qualitative and sequential elements that a trainee will experience. Only by taking these into account would it be possible to assess the performance of a course. The foundations of what constituted such an experience were discussed in the meeting and a number of diagrams were prepared to illustrate the relationship between the specification of key skills or competencies and the progressive nature of professional development in all of these areas.



6_4.drw

Figure 6.4 Operations tree - Proposed format for defining interview & assessment

The 'Operations tree', Figure 6.4, evolved during the course of the meeting as the senior investigators and the Director clearly outlined the major areas of competence that were essential to a 'good investigator'. The extent of the definition was to be decided by the CLA staff that made up the training team. Clearly the development of the training course up to the date of the meeting had been coherent and was a good overall mix of

experience. The difficulty lay in achieving a progressive sequence of professional performance from an explicit structure. For this reason Figure 6.4 was used as a mechanism in the meeting to discuss the context of operations and how these related to a hierarchy of investigative skills. The clear vision of the investigator's role provided by the CLA, was expressed both in their identification of these 'core competencies' e.g. subject knowledge, 'fit in organisation' and in their determination to give fieldwork experience at an early stage.

The meeting served two purposes, firstly agreement was confirmed between the Director and the Senior investigators as to what 'a good course' should include. Secondly, the provision of a structure could be tested to anticipate whether this agreement could be formally recorded. The recording method needed to be structured to cope with the increased formality due to growth in trainee numbers. By developing a recording mechanism it was intended that the existing standards of training should not only be maintained, but justified appropriately, developed and if proven successful, communicated to other trainers and the selection process within the Commission. Qualitative assessments can only be relative measures comparing previous performance procedures. Thus judgements being made about the course need to be based upon a comparison of those completing the current programme alongside those 'sitting with Nellie'. A variety of mechanisms are available for ongoing systems of assessment to support training courses. A combination of tutorial / fieldwork practice assessments and self evaluation for the participant are possible and these need to be reviewed in the light of the final programme and the amount of time that it was viable for tutors to spend in guiding trainees through the course.

During the meeting it became clear that the 'Operations Tree' could be used to formalise an agreed agenda for training which could then be discussed with individual trainees. The next concern was the development of a structured mechanism for assessment. The assessment schedule was dependent on the value judgements of senior investigators responsible for monitoring progress. However, this should not and can not be avoided as ultimately the investigator is to become part of the team. The difficulty that this poses for the trainee is that what is agreed to be 'good practice' is not easily made clear and that comparisons made between tutors about a trainee's progress are hard to justify and difficult to structure in discussions or progress meetings. Judgements made by experienced staff are at the centre of any professional appraisal system. What is important is the agreement of the criteria upon which these assessments are made and the communication of these ideals to the trainee.

The fieldwork assessment profile, Figure 6.5, offers a method of building an assessment scheme from the training agenda devised using the 'Operations Tree', Figure 6.4. This structure was discussed at the meeting between the Director, Senior investigators and trainers and the comments provided by the CLA staff were used to illustrate what characteristics distinguish good and bad performance by an experienced investigator, in all operational areas. Clearly, poor performance can be due to a number of factors varying from lack of experience and inadequate recognition of the consequences of their actions to poor training or even lack of suitability for the post. What is important is that for whatever reason, these problems are identified early, recognised by the trainee as well as the tutor and measures are taken to overcome them. Figure 6.5 emphasises the

approach to developing such a schedule, though the researcher's own limited knowledge of the investigator's full role did not enable a complete profile to be prepared in the time available. It was agreed that this preparation would be taken on by the training and tutoring staff if appropriate.

FIELDWORK PROFESSIONAL PRACTICE ASSESSMENT PROFILE							
INVESTIGATOR: - - - - - DATE: - - - - -							
PROFILE CATEGORY	CRITERIA FOR HIGH RATINGS	VERY HIGH	HIGH	AVERAGE	LOW	VERY LOW	CRITERIA FOR LOW RATINGS
Case references	Good knowledge of current progress on case, good notes	✓					Little or no previous knowledge of correspondence, poor detail of progress
Planning & preparation				✓			
Relationships with clients	Pleasant & purposeful with recognition of and response to needs of individuals		✓				Cold, unhappy and brief encounters, regarded with suspicion
Relationships with authorities			✓				
Management & control of investigation				✓			
Interview techniques					✓		
Explanation of investigator's role				✓			
Record keeping	Ability to use valid recording systems for case notes, indicating action where appropriate				✓		Poor or no records, poor evidence of progress, no recommendations for action
Commitments made: Date to reply / respond						✓	
Self evaluation			✓				Little awareness of performance. Tendency to regard external causes for failure
etc.							

6.5.drw

Figure 6.5 Assessment profile

The 'Assessment profile', Figure 6.5, is developed to show the attributes of each operation and then disaggregated to provide an assessment criteria. Throughout the course, as trainees are introduced to each study area progressing through assignments, they should gain a deeper understanding of professional practice. This is represented in the 'Spiral Curriculum' diagram, shown earlier in Figure 6.2. This is also implicit within the assessment profile which guides trainees, in discussion with their tutors, through what is good practice and the direction that their training should be going. The 'Operations Tree', Figure 6.4, also helps to guide trainees through the course in that their expectation of knowing what is next and how to assess the progress they are making should become evident. Staff at the CLA were clear about the direction needed to encourage professional competence using the profile to generate interest amongst trainees and define appropriate standards. The professional practice profile could be used throughout the training for this purpose. Profiling of this type offers the opportunity to identify and discuss performance with both trained and untrained

investigators in a confidential manner whilst also enabling discussion of professional practice with the group of trainees. This method enables self evaluation to progress towards targets which may, or may not, be apparent to the inexperienced (or even insensitive) practitioner.

By using an 'Operations Tree' and then 'Assessment profile', it is possible to ask evaluative questions of both the course and trainees with an accompanying criteria to analyse the answers. Guidance to tutors may be necessary as to using the full scale of high to low correctly, whilst targeting weak areas sensitively without destroying confidence. As the course develops ongoing issues could be included such as changes in legislation etc. immediately placing these in the training structure. Another consequence of the discussion was that such a profile may be linked to the recruitment criteria, or recruitment linked to training input. This would encourage the training provision to be planned against the experience of new appointees. Summary evaluations of the course can still remain in place such as 'state five good and five bad features of the course', as these are adequate for the work, and a refreshing break from structured inputs.

During the meeting a number of practical issues for future training emerged. Computer use was increasing as a feature of the investigator's work and it was suggested that IT training could be included as part of the course, even though this was often provided by external consultants. This technical training could be improved by focusing exercises on planned work for each investigator. This would however require preparation and trainer liaison with consultants in order to prepare assignments for the trainees. By splitting the course into six and four week blocks it would enable trainees to reflect, identify problems, recognise progress, test skills learnt, as well as provide an essential break for the trainers. In conclusion it is clear that the organisational training issue most greatly affecting the course is the choice between ad hoc, individual, or bunched recruitment. The method provided should contribute to both maintaining and raising standards.

6.6 Research output

As a consequence of the meetings the CLA responded by

- introducing a training programme that used an assessment profile to reflect professional competencies and organisational ethos.
- shifted the nature of training from one which was a form of 'sitting with Nellie' to a formal programme that selected the best features of tutorial guidance
- demonstrated that the programme could work and was manageable for the trainers;

- provided a good demonstration that an organisation can relate existing knowledge to a variety of training delivery mechanisms via a centrally planned training curriculum.
- showed that in a knowledge based organisation it is important to focus on the role of the individual as an agent of knowledge exploitation in the organisation, thus it is crucial that the management of the organisation match the organisational setting (context) to the substantive and contextual knowledge needs.

The programme of work with the CLA offers a useful example of a knowledge based organisation that is 'flat' in hierarchical structure and has a straightforward, though increasing, programme of work. This example of an organisation is an unusual case where structural factors are minimal and the external influences on the organisation are less than in many commercial organisations. However it is for this reason that the CLA offers such insights. It recognises that structural factors are influential and that training can perform effectively and recognise at an organisational level when these factors are not evident.

The issue of the role of the individual in knowledge based organisations will be returned to in Chapter 8.

CHAPTER 7

7. Exploiting training - A manager's perspective

7.1 Structural factors, assimilation and relevance

In Chapter 3 a distinction was made between learning models of the individual and those of the organisation. Evidence of this observation is shown where a manager makes the distinction between the assessment of an individual's performance and the qualities, such as ethos, desirable for the organisation as a whole. The example in the previous chapter shows that the translation of ethos and implicit knowledge into explicit learning requirements by a manager is not direct. The manager must take account of the process of learning, the process of the learner understanding context and the translation of that 'context' into concrete learning experiences. These considerations are evident even for what can be seen as instrumental knowledge, albeit at high levels. At this stage a useful question to ask is, if such clear distinctions can be made between training design models and the knowledge requirements of managers then to what extent do the training issues identified in Chapter 5 represent the concerns of line-managers? This question, identified in the research design Chapter 4, recognises knowledge based organisations as good examples where the management of learning, and in some cases knowledge itself, is an explicit consideration within the firm.

This chapter uses a model of training issues, structured from a 'training centric' view to elicit the concerns faced by a manager who is responsible for both the training of staff within his organisation as well as evaluating staff performance. As a senior project manager with line managerial responsibilities for other project managers and junior staff, the respondent interviewed here has additional responsibilities for the allocation of training resources to staff within his section. This example neatly represents the coincidence of responsibility for performance as well as achievement in learning and uncovers the concerns, compromises and limitations placed upon managers when attempting to maximise the benefits from training investment.

It is evident from this example that the manager's responsibility, aside from motivation, is to maximise the exploitation of investments in learning whilst maintaining the long term objectives of the organisation and those of his staff. As knowledge exploitation is the primary concern of the manager a model of individual knowledge exploitation is used within this chapter to interpret managerial concerns elicited with respect to the organisation.

Chapter 3 argues that a difference exists between an organisation 'learning' i.e. the process of cumulative knowledge, and an individual learning i.e. the cognitive acquisition, understanding and assimilation of knowledge. However, both models use the term assimilation. The proposed model uses three axes to summarise the dimensions of individual knowledge exploitation, Figure 7.1. Each dimension of knowledge exploitation has a variety of attributes and these are discussed with respect to

examples provided from the research. One dimension of the model collates the parameters that arise from an organisation's inability or unwillingness to change structures that prevent knowledge use. These 'structural factors' refer to the organisational features which impinge upon an individual's freedom or motivation to use what is learnt from the acquired knowledge.

The concept of 'assimilation' is incorporated in the exploitation model. However, this term has already been used with reference to the take-up of knowledge by an organisation into established procedures (Gilbert 1995). In this chapter a distinction is made between using assimilation as a concept within the exploitation model to separate the characteristics of human learning and cognition and the acceptance and routinisation of procedures that are taken to represent learning from an organisational perspective. Thus assimilation in this model refers to the individual's own absorption of knowledge prior to exercising its use.

Finally, 'relevance' as a dimension is used here to refer to the congruence of the individual's knowledge to the organisational context. The test of relevance is determined by what the manager recognises is needed and what is acquired by the individual. Mis-specification of training needs is a clear example of low relevance, even though the individual may learn effectively.

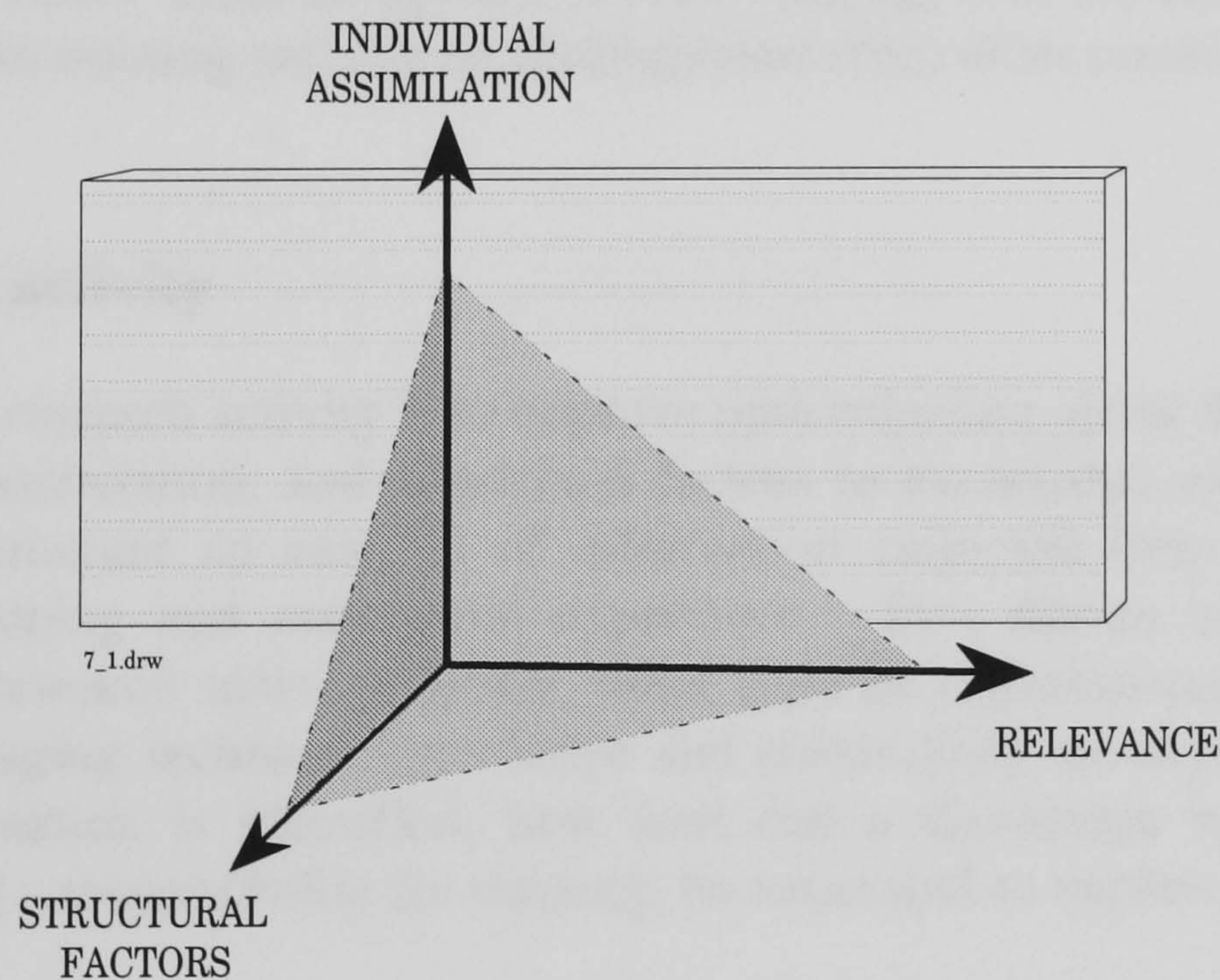


Figure 7.1 Knowledge exploitation-Structural factors, assimilation & relevance

The model of 'structural factors, assimilation and relevance' (SFAR), Figure 7.1, is used to help analyse the research activity. The model reflects varying degrees of organisational success in achieving the exploitation of benefits from training investment. Success or failure in exploiting the benefits from training are not always within the control of the organisation. However, using evaluative models with their origins in training or instructional design offers little guidance for managers in their key role, i.e. co-ordinating the influences of the organisation.

The priority to define appropriate knowledge or ‘relevance’ must be matched with an environment and experience conducive to learning, ‘assimilation’, and a commitment to overcome the organisational barriers which occur preventing the use of knowledge. Throughout the thesis reference has been made to the contextual and structural factors that prevent knowledge being used, however, in practice this research shows that most of the barriers to the exploitation of training are due to what may be called the ‘structural factors’. It is clear that the distinction between these is that situational factors are derived from training and training research while from the manager’s perspective they are revealed as structural factors which are described at the end of this chapter. Often the control of these factors evade the influence of training managers. Operational responsibilities frequently prevent training purchasers or managers from appreciating all elements of the model and it is often external influences which further reduce the exploitation of learning provision. The conceptual model in Figure 7.1 is a simple attempt to explore the relationships between structural factors, assimilation and relevance. As will be seen in Section 7.4 this model provides a potentially powerful mechanism for analysing the perceptions of a manager.

The sequence of the chapter is as follows. The design issues for this part of the research are explained and the reasons for focusing on a single knowledge based organisation with technical knowledge requirements discussed. The design of a mechanism to structure an elicitation exercise is then outlined which provides a focus for discussion during the interview. Thus an agenda of issues emerge that are relevant to knowledge exploitation from training and can be distinguished from other contributions.

7.2 Research activity

The aim of this research activity is to improve understanding about the qualitative nature of relevance, assimilation, and situational factors in knowledge exploitation. This is then used to structure an analysis of information collected from a respondent with professional training and managerial experience. Two design issues arise that are central to the research activity; firstly, what type of organisations have the greatest interest in managing technical knowledge and maximising its exploitation. Secondly once an organisation is identified, how best can a discussion with an experienced manager having a responsibility for training, be structured to explore the model.

7.2.1 A Conceptual framework for structuring elicitation

Developing an interview frame that focuses in a structured way on the qualitative nature of knowledge exploitation is difficult. Likewise practical difficulties arise when contemplating a wholly open agenda on training during an interview. Such an approach would be likely to focus largely on the procedural issues of training and require significant time from a senior manager. Thus the earlier critique of the evaluative models of training offers a useful starting point. It is suggested that by asking managers for their views about the limitations of a given model, useful insights may be obtained.

This is particularly the case when interested in the central difficulties that managers perceive in exploiting the investment in knowledge provided from training.

7.2.2 Background to the organisation

The manager contributing to this research activity has responsibility for the training of all project staff in this section of the company. As a medium sized firm of civil engineering consultants the company has approximately 700 employees throughout the UK. The major sectors that the company works in are road and public transport networks with particular specialisms in bridge and immersed tunnelling projects. Contact between the manager and researcher has existed for some time and the issues of education and training are frequently discussed when meeting.

The civil engineering sector has experienced significant changes in market opportunities over the last ten years. Major growth in the 'boom' of the late 1980s, recessionary cut-backs in the roads programme during in early '90s, followed by a proposed expansion of the motorway network and an unplanned reduction in public spending have significantly reduced and made uncertain civil engineering projects funded by developers and public bodies. This commercial operating climate is reflected in the interview, however it is important to note that many companies in the sector have experienced pay-cuts or freezes, take-overs, redundancies and closure. Uncertainty of this scale is unique in the modern history of the large-project civil engineering sector.

7.3 Using the model of issues in the training cycle

The manager assessed the training cycle issues model, Figure 7.3. From this commentary it is possible to impose the structure of SFAR on the recorded dialogue to identify the issues which were of most interest for the exploitation of training. In addition a number of general management issues were raised concerning the contribution of training and the constraints imposed by professional bodies requiring formal 'off-the-job' training. Most importantly the significance of external influences on training and the managerial concerns of project-oriented knowledge-based organisations are discussed.

The procedure for analysing the discussion uses SFAR to interpret each of the major themes in the text. In each case the model is used to highlight the configuration of the three dimensions. Text from the interview (Appendix E) is analysed using SFAR and the attributes of the dimensions discussed. In each case the inserted text is either selected with reference to the original dialogue in Appendix E, or it is paraphrased by the author for clarity in this context. Reference to individual sections of the dialogue are quoted in italics for clarity and used to illustrate the issue, as follows.

An explanation of the model (Figure 7.2) was offered at the outset of the discussion in the following way, the material is an edited version of the interview dialogue recorded in Appendix E, with direct quotations entered into the text in italics.

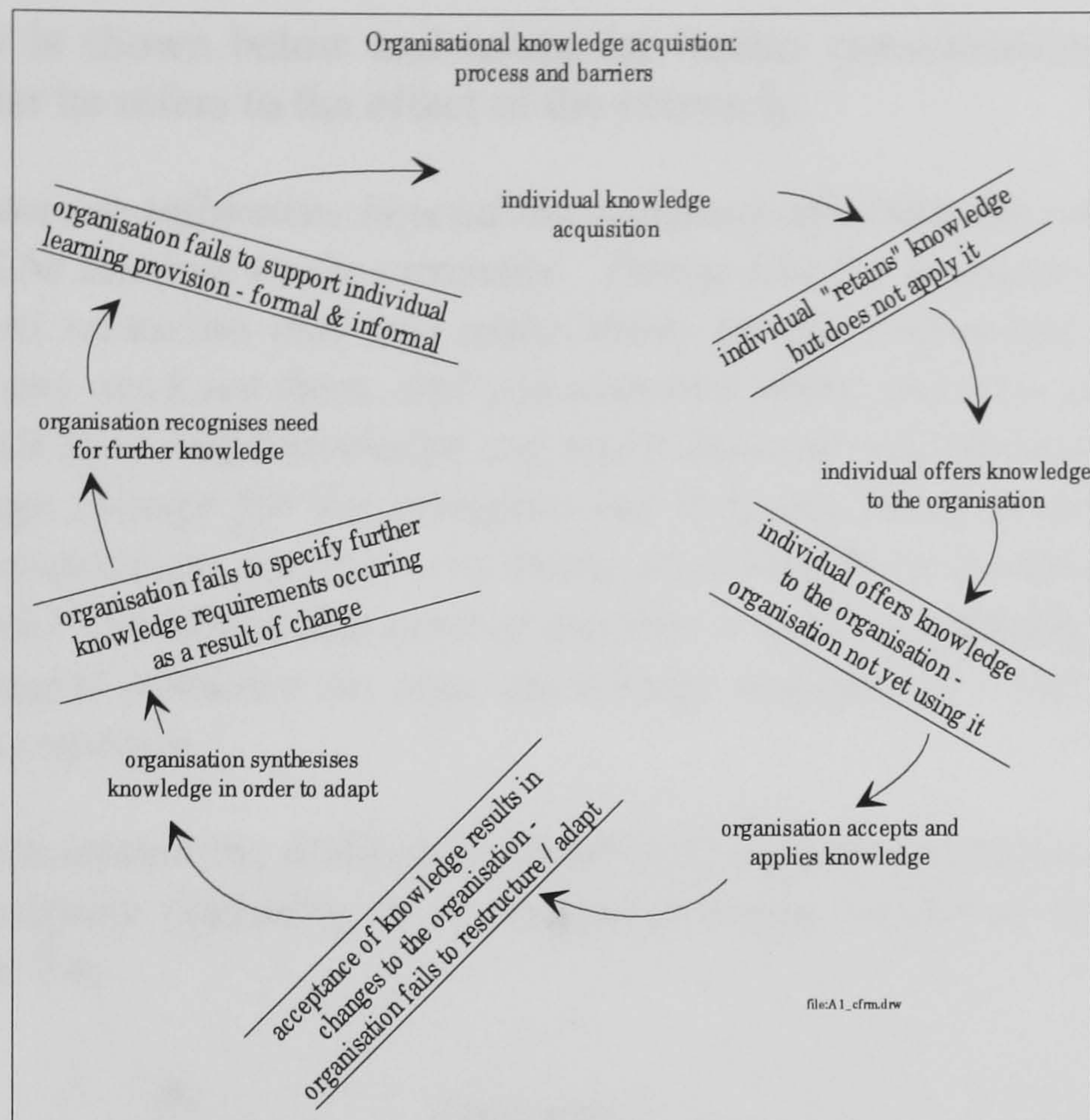


Figure 7.2 Model of issues in the training cycle

The respondent's first reaction to the model was that the process of training and knowledge acquisition from a manager's point of view is *'not a closed loop'*

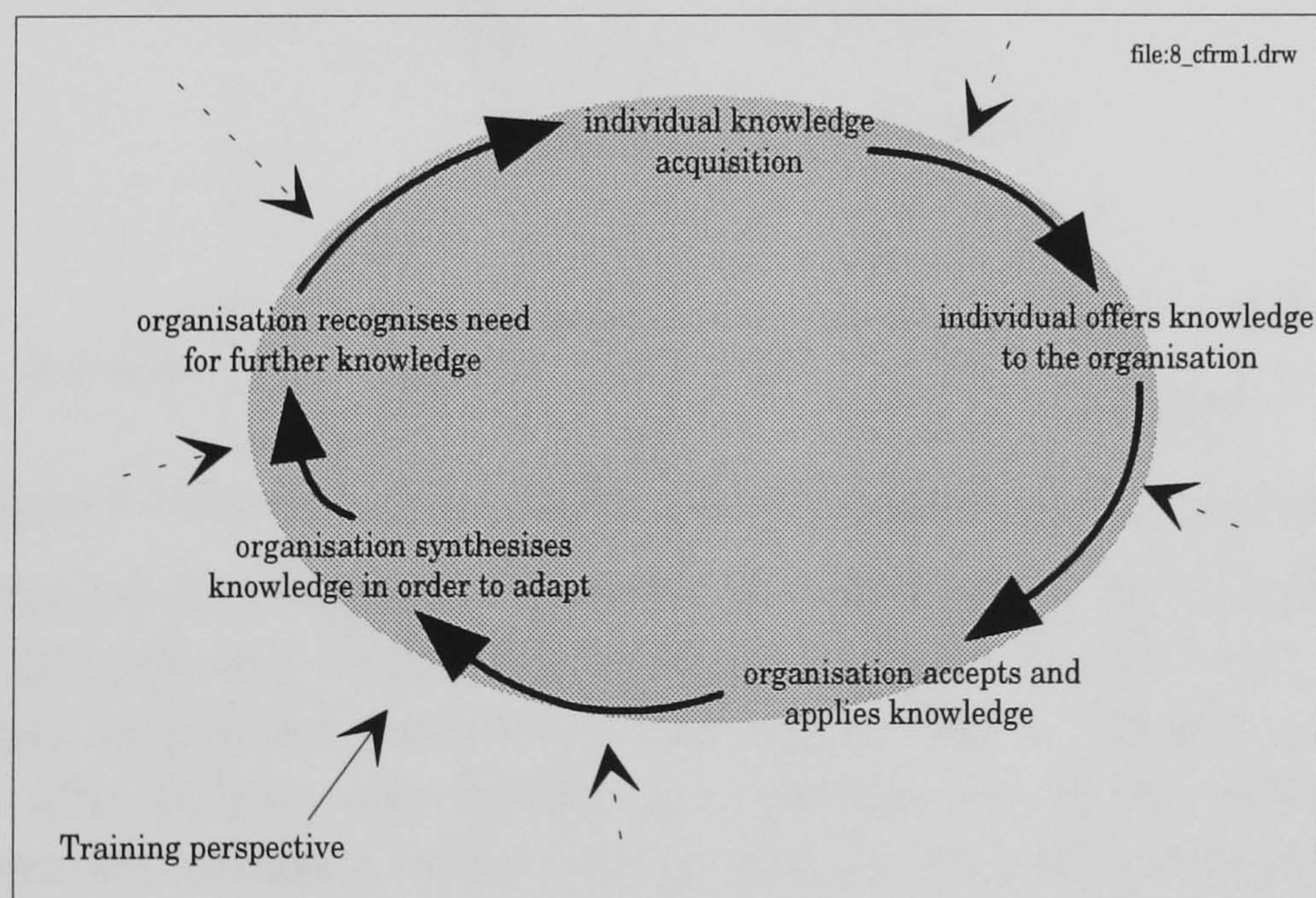


Figure 7.3 Training cycle and external factors

'I think probably at every stage in the model the biggest lines are doing this-sketching environmental impacts on the model (Figure 7.3), things outside of this picture as you have it.'

At this point the respondent constructed a diagram of how he perceived this process (Figure 7.3), a diagram in which the training cycle is dominant but external influences are recognised.

His commentary is shown below and issues for further consideration are identified in bold. In particular he refers to the effect of the economy.

*'Some of them are influences beyond the company affecting the company, some of them will be internal to the company. Things like for example, the economy plunges in to recession and you make thirty people redundant because you haven't got any work for them, and you wait two years and then you have work and you don't have any knowledge any more because you threw it away. Now that is a huge change for the company but it is not being provoked by your knowledge acquisition exercise, it's being provoked by a completely external influence and I would say that most of the time it is those **external factors** that have the biggest influence on your knowledge acquisition / utilisation needs and how they operate.'*

The respondent illustrated the difficulties faced with exploiting acquired knowledge in a project-based company operating in an industrial sector subject to large variability in workload, Figure 7.4;

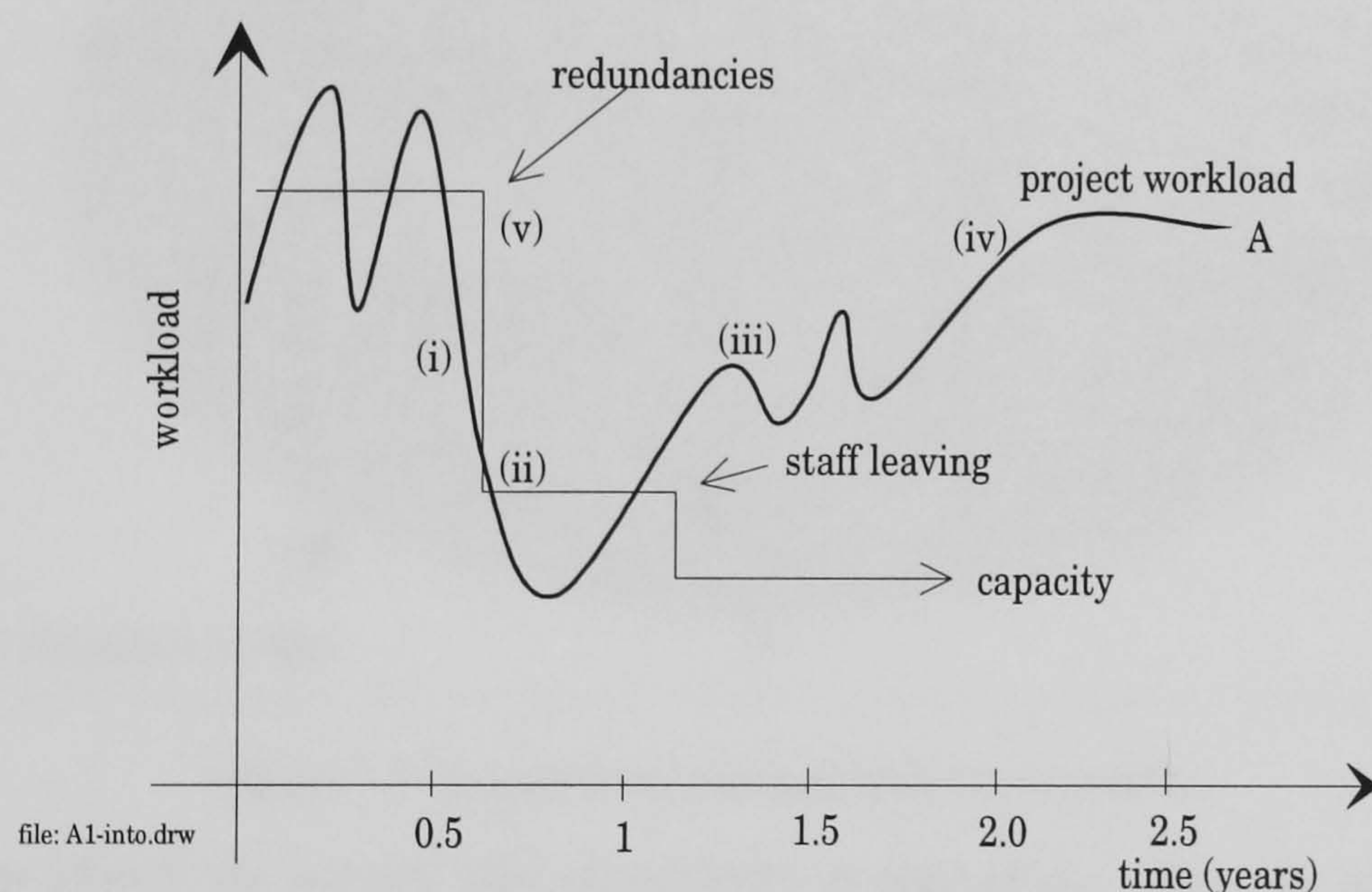


Figure 7.4 Influences to knowledge and work capacity in the organisation

One interpretation of this diagram is that the development of the firm and its problems in adapting are substantially influenced by market factors. In this case, even though the organisation may synthesise knowledge and adapt, this is largely a function of its critical mass. This reflects the management perspective which emphasises external factors as the greatest influence on knowledge acquisition and cumulative knowledge.

In considering the model as a 'closed' systems view of knowledge acquisition and its failure to capture the essential features of the external environment, he says;

'This model can be a spiral as you go round getting better and better and better. A little bit stronger and more expert in your area. But the way I see the model is you go round this loop and if you plot the company's knowledge base every time you hit his point as you get round the loop then you might be doing this nicely. It will be if nothing bad is happening. But over here you might get a haemorrhage of staff and over here you might get a horrible dip in the

economy meaning you've not got enough work to do, when everyone is kicking about. And another effect of a hardened dip in the economy is you get big management upheavals. And that's very damaging to knowledge. Everyone gets scared. What we were describing as the gatekeeper effect in specialists, in our company we've had a particularly bad period of that in the last couple of years because everyone's been scared for their job. Everyone is fearing they may not be in a job in a couple of months time. Everyone is feeling 'the company is looking at me I must prove my worth.' People therefore focus in on themselves and not to the benefit of their department or the whole company.'

He offered his own version of the model in order to account for what he called 'the business environment'

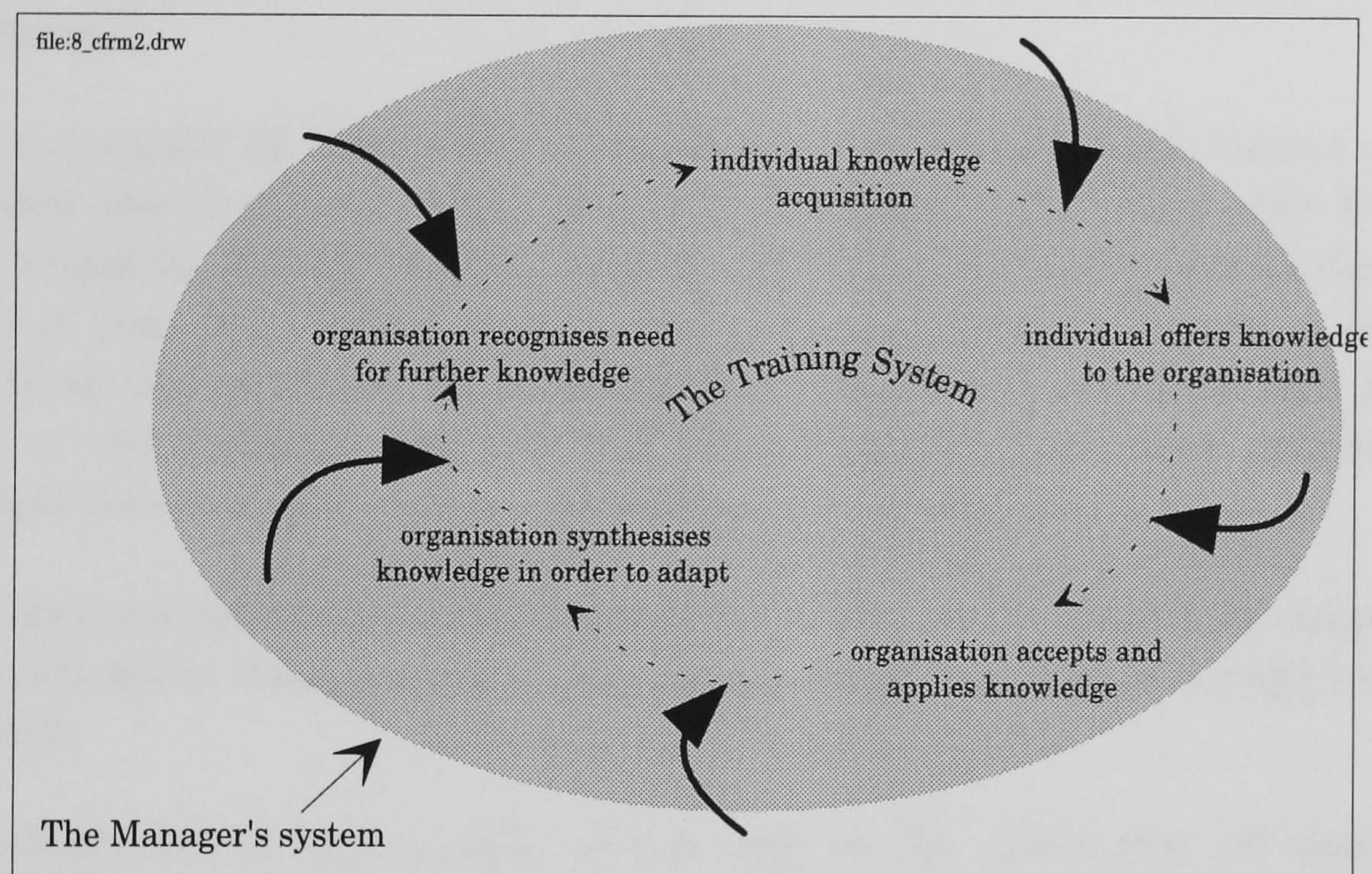


Figure 7.5 Impact from the business environment

'So you can climb the model and then drop at any stage. You've got to look at your loop as having things coming out of it at all stages and these arrows (Figure 7.5, pointing in from the environment) are more significant than these ones (pointing inwards - referencing knowledge gain).'

He followed this observation about the training cycle with an example of the extent to which external factors are dominant from a manager's perspective.

'And the trick of the successful company is to absorb these punches when they are punches (a deficit in work) and to absorb them when they are benefits (an increase in workload) so that then you get one of these when it is a benefit, like the government announces a huge increase in the roads programme, you can either utilise your knowledge you already possess to increase your business and make money or not quite bother to. So if these good things are around you can jump up the scale and overcome competitors, but you've got to recognise that all of these are a case of trying to achieve stability and what you get if you do that too steeply is, what you get if you get an increase in the roads programme is, you take on thirty new experts. And then the government changes its mind

because the taxes have gone up and they're embarrassed and they stop the roads programme like they did three months ago. They've just hacked a great lump out of it. We've had three projects terminated, big projects that employ twenty people each and have been terminated on three months notice. Projects that will run for three to four years and we were told on the first of July it's all over, wind it up. And they'll pay us a bit of compensation for terminating our project in accordance with our contract but that doesn't keep us in work. All those people who used to do that we now have to find work for.... So this model is like a model of the whole stability of the business if you like, so the way you handle your business has got to be able to handle the shocks from external influences, which can be very significant.'

When asked to consider the model as a diagnostic tool from the point of view of a manager, he said;

'I have a couple of reservations. As we have talked round this loop I am not sure that this is a loop where you start here and walk round step by step. These could be seen as subjects all just relating to the same central theme by spokes if you like. Which aren't necessarily progressions around a loop. I think if we talked about things in another order we would have had just as useful a conversation and I'm not sure it would have been immediately apparent that it wasn't such a logical flow.'

The researcher pointed out that training managers refer to this idea of the loop and asked the respondent about what environmental factors break the loop or change its sequence. He explained;

'It's almost not a loop at all. It's a loop in the sense that an individual undergoing training goes round the loop, but the manager has to have all these things in parallel and what he has to be doing in my current view is: "I've got training costs - how much can I afford to spend, I've got the desires of individuals - what training do they actually wish to undertake and what do they think is worthwhile training, I've got training availability - training to match our specific needs." There's this whole mass of things. But what I think the training manager has to think about is not how those things relate to each other because I think that's rather obvious but how those things are impacted upon by the outside world. So my current view on training needs is going to be changing steadily more as a result of what is going to be changing in the company as a whole, and well beyond the company than it is as a result of training. And I think one of the dangers of the specialist training departments when you have a company of five hundred people which has five people labelled as trainers who sit in an office together and are not involved in the delivery of the product, then what they know about is the delivery of training. What they are interested in is the training process and I think that type of training manager is the guy who will be terribly interested in the closed loop and won't tend to look beyond it. My job is essentially about the delivery of our product and I'm a training manager on the side. Very much in that order of priority to my company.'

7.4 Exploring the dimensions and their attributes in the SFAR model

He then goes on to draw attention to the role of University graduates, a particularly relevant issue for a knowledge based organisation of this type.

'So that, take another example, you've got a really good training programme, you've got new staff coming in as University graduates, you put them through three or four years of excellent, well thought out training which is just the right sort which prepares them brilliantly for their future in engineering. The consequence is that a large majority might leave than would do otherwise if you gave them lousy training because they have actually been better equipped to get jobs elsewhere. The other result is that if you give them excellent training they might feel some loyalty to the company and they might want to stay there.'

And he further identifies the differences between well structured and expensive training programmes for such graduates and the limited opportunity for them to use that knowledge resulting in the loss of trained staff and therefore the investment in training.

But one of the problems with training and this is particularly recognised in organisations like local authorities where they often have very expensive well structured training programmes but they don't have particularly exciting career paths for middle management, so people go to them for this very well structured training, wait five years and then leave. And this can be a very big external influence on your organisation's knowledge resulting from the training which you spent money on. You see you put knowledge into all your junior staff, you feed it in, and then it filters out the door again. So you've got a haemorrhage on your loop.'

This can be seen in terms of the three SFAR dimensions in the following way. The textual material above **in bold** is taken as the focus of an issue to be analysed further. Thus 'well structured training' implies high levels of relevance and assimilation by trainees but the remainder of the text implies a failure by the organisation to be able to use that knowledge because of limitations in its internal structure.

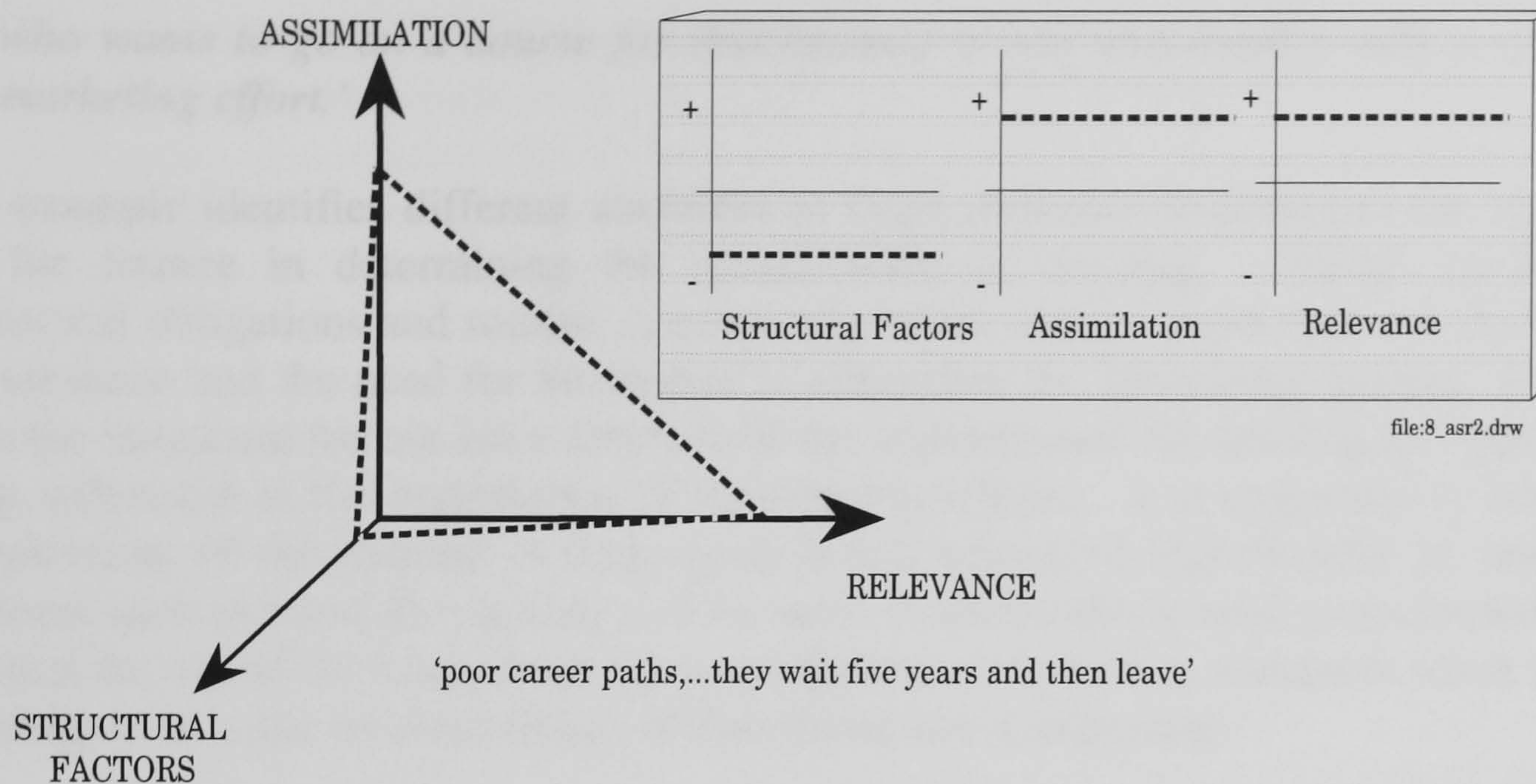


Figure 7.6 Influence of staff mobility on exploitation of training

'..one of the problems with training...where they often have well structured training ...but they don't have ..career paths ,...people go to them,...wait ...and then leave'.

A common difficulty in exploiting training experiences when knowledge has been assimilated and is recognised to be of direct relevance to the organisation is that this knowledge is often of benefit to other organisations as well. The competitive value of knowledge in many organisations ensures not only a high motivation for the trainee to assimilate knowledge but their recognition of the enhanced opportunities which such knowledge offers to their career.

The difficulty in selecting training from the wide range of providers was mentioned and again the issue of external reputation of both the individual and the organisation was apparent.

*'One thing that I might have someone seeking training on is design standards for bridges. There are a number of basic design **standards** which we use in huge quantity, **all our junior engineers** slog through them and **have to know them inside out**. And so a lot of people run a two day introduction to the basic design standards in bridges, B.S.5400. And we've managed over the years to establish one or two suppliers of this type of course who do a reasonable job, I don't have to get in to the detail of the course as it's on a specific technical subject and I know it will be useful. **So that's a clean cut case** where we know what is in the course and we know it'll be utilised fairly directly, fairly quickly thereafter. Another example but different is Health & Safety training. We now have a certain amount of obligation in law to training people in Health & Safety, and we have a certain need from a marketing point of view to be able to deliver jobs to staff who have Health and Safety training. Therefore if somebody seeks training in the Health & Safety area or training relating to new government legislation, new legislation has just come out, the construction, design and management regulations which are all H&S and there are courses running on that at the moment, and I can't turn-down someone*

who wants to go on a course for that because it will undoubtedly add to our marketing effort.'

This example identifies different attributes to those normally available to the manager and the trainee in determining the specification of training. Market conditions, contractual obligations and routine external influences such as regulation can determine the relevance and the need for the trainee to assimilate the knowledge gained. In these cases the structural factors have determined the requirements for training as opposed to being influential in the exploitation of learning experience. It is important to note that the relevance of the training in such cases is not influenced significantly by temporal attributes such as when the training will be used. Exploitation in such cases includes the potential for use of the knowledge e.g. a recognition of industrial standards when not all are likely to be used, but knowledge of their existence is important.

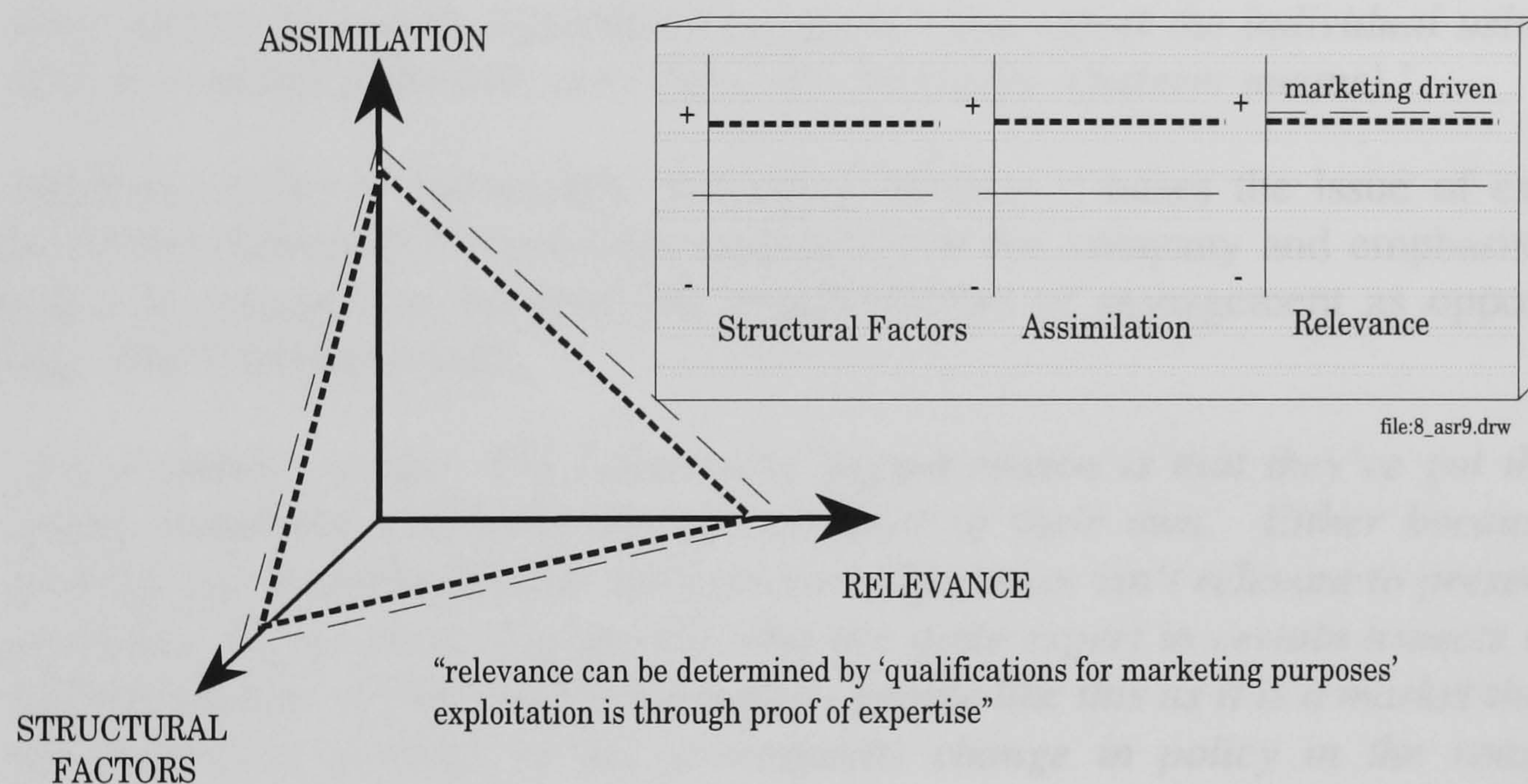


Figure 7.7 Relevance is driven by marketing needs

'...standards..., all our engineers...have to know them inside out. And so a lot of people run a two day introduction.... So that's a clean cut case'.

In more common circumstances the routine elements within an organisation's procedures will necessitate training of a particularly specialised nature. Such specialist training may be an inevitable requirement for staff and is thus accepted as essential for performing the job. An interesting distinction is made in the above example where the training in standards is essential for routine performance, whereas the essential nature of Health & Safety training-assuming it is followed, is that this form of training is used to underwrite the potential liabilities that may occur from a design consultancy. The exploitation of knowledge by secondary measures such as for 'an insurance policy' or as a 'motivating device' for routine tasks e.g. time off the job, are commonly accepted justifications for training in many firms.

The respondent in the context of project-based training distinguishes between the issue of training and the role of training as a marketing aid.

'But the reason for that is nothing to do with training, it's to do with marketing. To have your company appear in auspicious journals is considered good value. It probably took him a week and then someone else probably spent a day editing it and vetting it, and that is considered good value in a field where our name is well known. and we want to keep it that way.'

The researcher referred to the diagram identifying the area of 'applying knowledge in the firm' noting that relevant factors might be, the freedom to 'error make', the preparedness to share knowledge and whether 'gatekeeper effects' i.e. the tendency not to pass on information thus maintaining control, were relevant to his organisation. The researcher asked;

'Do you recognise these factors in your firm or are there measures in place to overcome these problems, either by positive action or other incidents that stop these factors becoming a problem? i.e. factors that affect the individual using their knowledge in the firm once they have learnt (by whatever means).'

The response to this is particularly interesting because it raises the issue of external effects on the influence of knowledge acquisition in the company and emphasises the difference in perspectives between the responsibilities of management as opposed to training. The respondent said,

*'A few reasons occur. The commonest biggest reason is that they've got the wrong knowledge. Usually through no fault of their own. Either because training was badly focused or because past experience isn't relevant to present problems. So we have some people who are quite expert in certain aspects of highway design. In fact we have too many people like this as it is a market that has shrunk as a result of the governments change in policy in the roads programme. So there is a lot of people who are experts in highway design, carriageway construction, drainage and we have a workload which we can't cope with, but it's not in that area. **These people have got the knowledge but they are not applying it because we haven't got the work to give them. That is much the biggest cause of not applying knowledge.'***

The above statement confirms the existing expertise of staff in given areas, recognising good assimilation and previous demonstration of expertise. Yet the relevance of training is no longer appropriate in this case and thus prevents the use of learning.

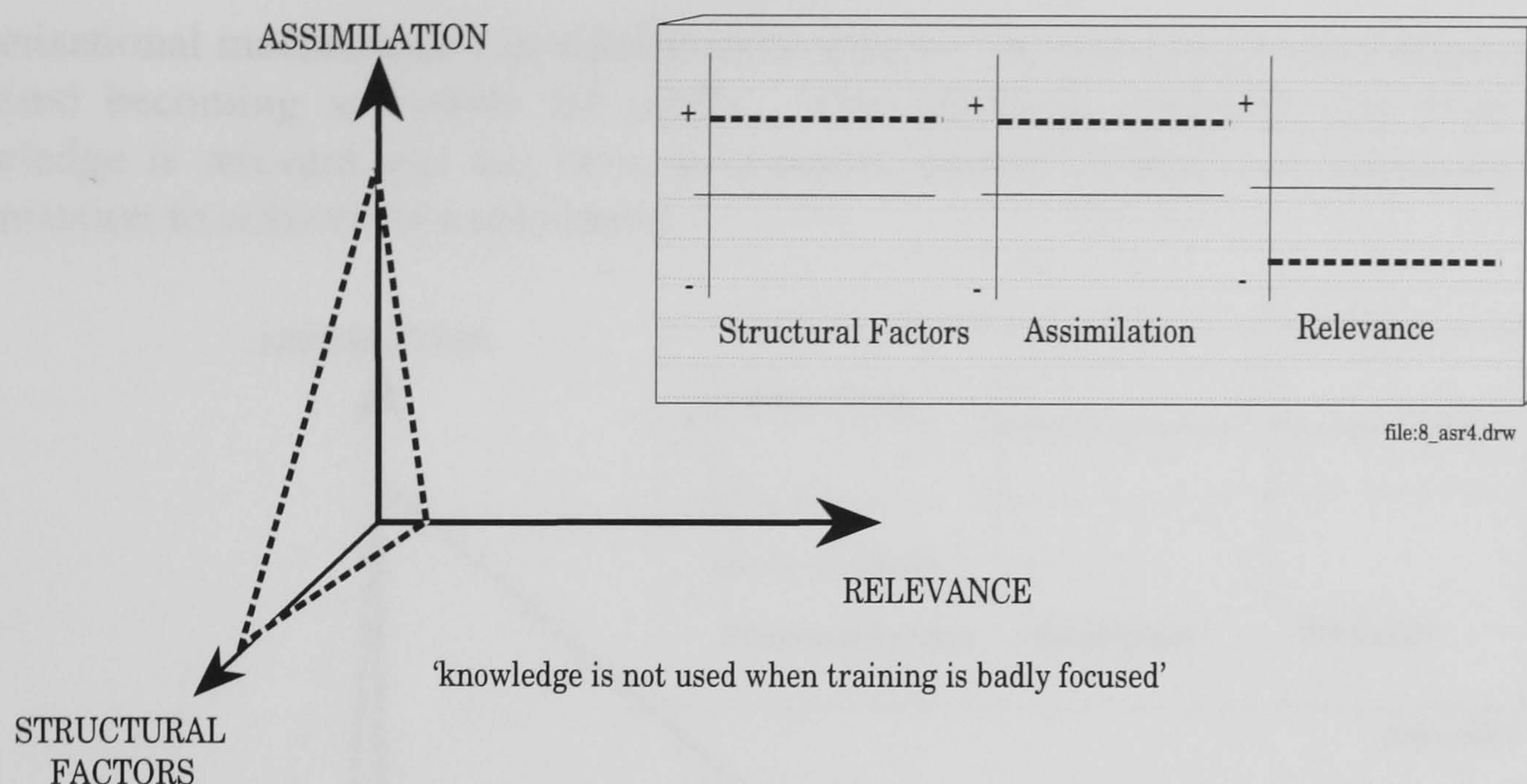


Figure 7.8 Knowledge is not applied when it is the wrong type

'These people have got the knowledge but they are not applying it because we haven't got the work to give them. That is much the biggest cause of not applying knowledge.'

Changes in the market or operating environment of organisations have fundamental influences on the diversity and quantity of knowledge that can be exploited and that which is required. Attention was drawn to the fact that the model refers to the willingness of an organisation to change and its ability to accommodate change. This reference in the model asks how a company can increase its accumulated knowledge and therefore be more adaptable. Knowledge accumulated in its procedures, its practices and also within the individuals themselves but where is it made accessible to the organisation? The respondent's reaction to this issue was quite strong;

*'This is something of a bee in my bonnet for my particular company. We do accumulate knowledge, as I say mostly at random, mostly because of what you are doing. **A great deal of knowledge is accumulated, but very little energy is put into rendering it accessible.** So that when people need it it's a large effort to obtain it and it's little recognised but an obvious fact that when its hard to get at people manage without it a lot of the time, rather than get it.'*

...there are two or three layers of seriousness if you like. Ultimately you could have a situation where somebody fails to obtain knowledge that the company already possesses and therefore delivers something that is negligent to the client. The much more likely consequence is just money, that someone is going to a job much more slowly than they ought to. So we won't be an efficient business. So if you've got competitors that are better at making the knowledge available than you are they'll be able to do the job much more cheaply than you are with the consequence that you'll go out of business. So it's an old argument in the co. that we don't make our knowledge accessible, that we don't put time and energy into what we've accumulated.'

Organisational mechanisms can significantly improve the chances of knowledge already acquired becoming accessible for others. The statement confirms that even where knowledge is relevant and has been assimilated, further changes are necessary in the organisation to achieve its exploitation.

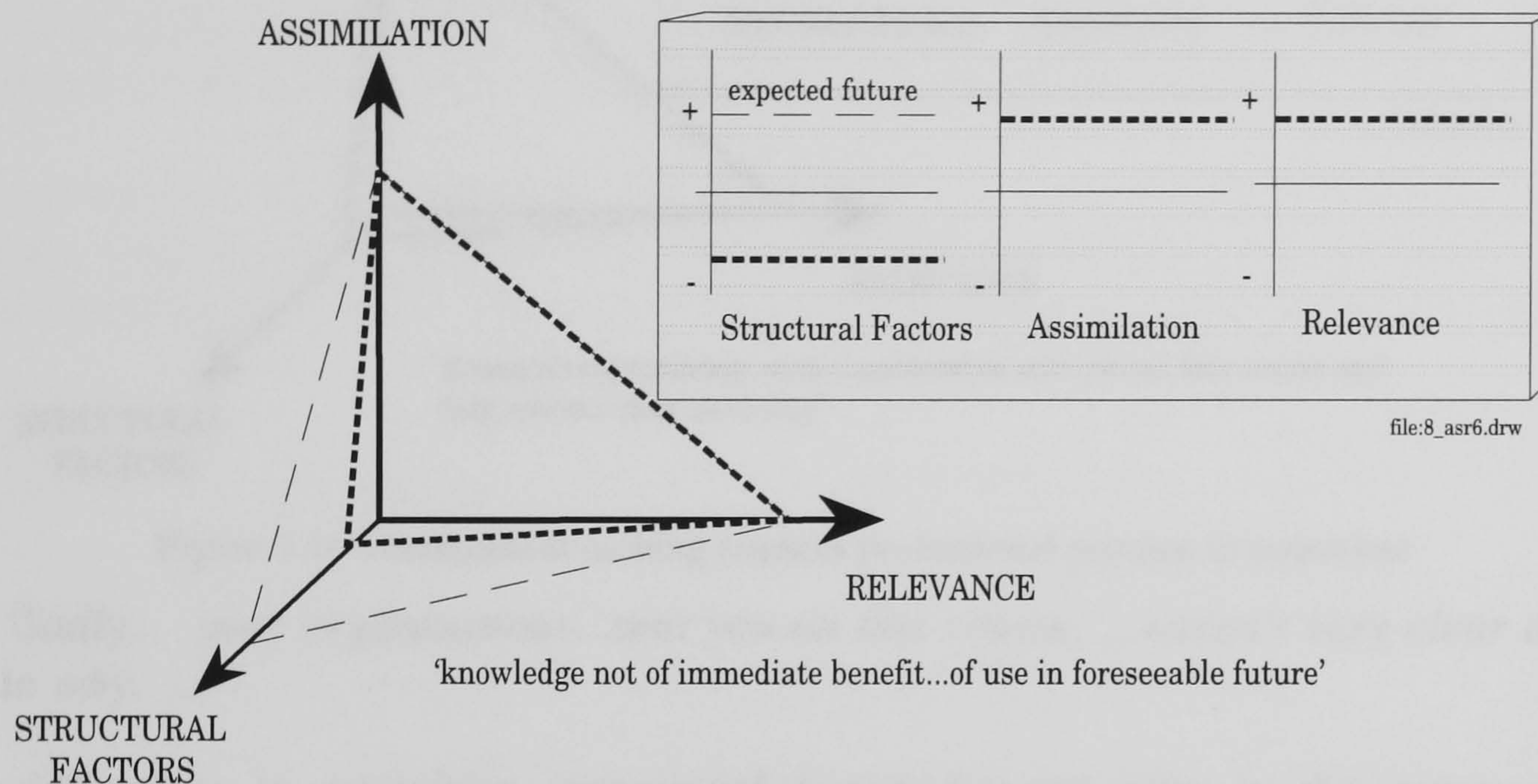


Figure 7.9 Job link to training is poor but benefit expected in the future

'A great deal of knowledge is accumulated, but very little energy is put into rendering it accessible.'

Frequently the limited opportunities to schedule training courses between the normal work deadlines prevent a coherent link being made between what a person normally does as part of their job and the training that they, or their manager believe will benefit the organisation in the future. Often the unavoidable consequence of attending training courses when they are requested by staff, or when they become available, reduces the opportunities to synchronise training with future knowledge needs in the firm.

'Sadly there's another group of you, and it's quite a big group who'll go back to your organisations who although they sent you on this course, weren't very clear as to why. They'll assume it will just make you better at your job but won't give you the recognition for what you've done and they won't ask you to do anything new, and indeed probably what they'll do if you push them with new ideas is they'll explain very nicely why they're not quite appropriate to the current circumstances. That group of you will get very depressed over the next six months and you'll feel like your jobs a waste of time.' And he fell into the second category,...'

Management training is commonly a complex compilation of differing expertise. It is implied from the earlier statement that whilst it is the ability of an individual to recognise relevant material and assimilate it, it is the structural factors in the organisation that can prevent this learning being used. Should the organisation adapt or change the constraining structural factors may be reduced and thus the training could be exploited.

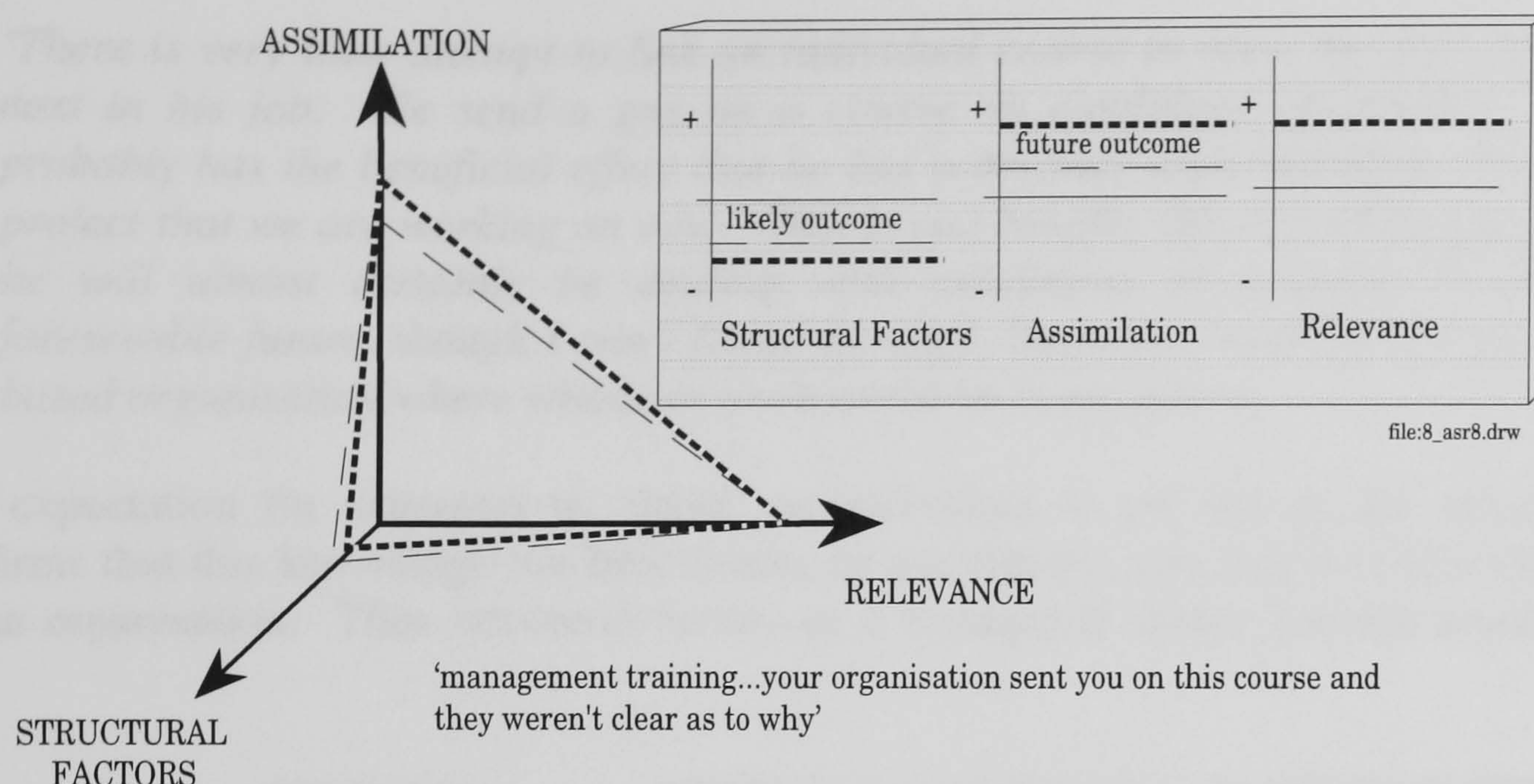


Figure 7.10 Management training requires professional practice to assimilate

'Sadly... your organisations...sent you on this course, ...weren't very clear as to why.'

The difficulties in exploiting managerial knowledge are seen in the personal and organisational risks that senior managers need to take to in order to shift responsibility and develop managerial skills in junior staff. Commonly either a lack of awareness on behalf of managers or the fear of passing responsibility to others seem to outweigh the financial costs to the organisation in losing the benefit of good managerial learning.

The respondent strongly emphasises the impact of managerial effects on the opportunities available for individuals to offer their acquired knowledge to the organisation.

'The next cause of not applying knowledge is what you may call a managerial deficiency, i.e. the poor management of individuals. Where you have an individual working for you who through his training (knowledge / ability / capability to do certain tasks) and you don't stretch him to the full you fail again. So you've got someone who is actually capable of doing something quite difficult and you don't let him do it because you are far too inclined to do it all yourself, so you have knowledge there, you have ability there and you hang onto the work and do it all yourself. And you ask your subordinate to do mundane things which are well within his capabilities instead of difficult things which will stretch him. There is an immediate loop here back to your first box, which is that if you don't drive an individual to use the knowledge he has, he learns more slowly. Because people learn more when they are pushed.'

The interviewer asked, how often the connection was made between outcomes of a course and the expectations of what they should be able to do or know when they come back. The respondent was then asked to consider the example of a person learning standard contracts. The response to this was;

'There is very little attempt to link an individual course to what the guy does next in his job. We send a guy on a course on conditions of contract, it probably has the beneficial effect that he has a broader understanding of the project that we are working on now. That is one benefit, the second benefit is he will almost certainly be dealing with conditions of contract in the foreseeable future, though I can't focus on when, because I work in a project based organisation where whatever work comes in is any guess.'

The expectation for managers to 'drive' an individual to use his or her knowledge confirms that this knowledge has been learnt, or assimilated, and that it is also relevant to the organisation. Thus structural factors of a managerial nature prevent knowledge use.

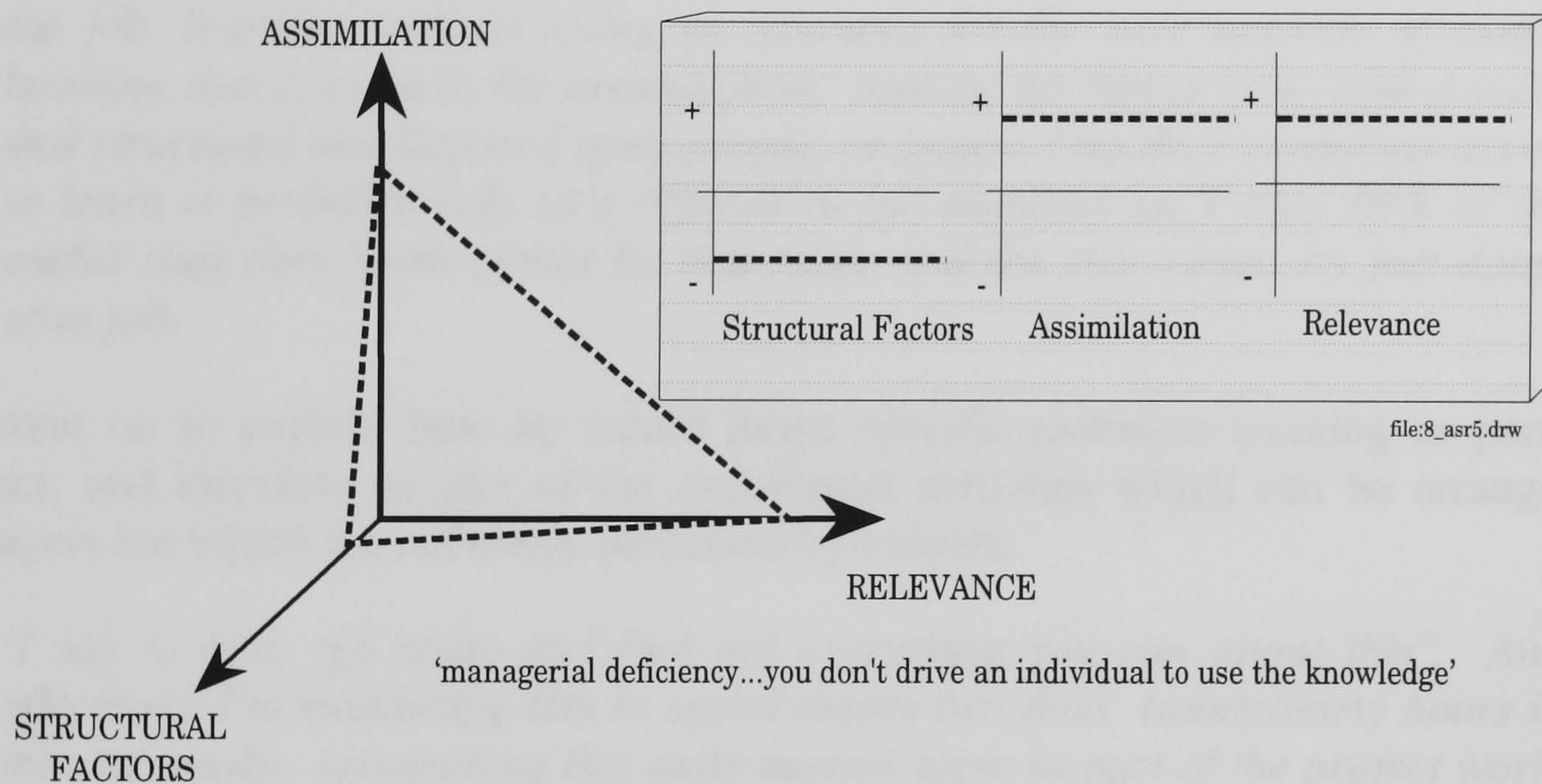


Figure 7.11 Managerial deficiencies prevent knowledge being used

'...you've got someone who is actually capable of doing something quite difficult and you don't let him do it because you are far too inclined to do it all yourself, ...'

The ability of individuals to assimilate knowledge and their preparedness to go-on assimilating knowledge which is of benefit to the firm is often subject to the recognition that this knowledge will be exploited. The personal benefit from achieving success in a demanding environment is often a factor in the original motivations of people joining knowledge based industries. Many people enjoy using learning and they experience frustration if their potential abilities are neither recognised, valued or required.

'There is very little attempt to link an individual course to what the guy does next in his job. We send a guy on a course on conditions of contract, it probably has the beneficial effect that he has a broader understanding of the project that we are working on now. That is one benefit, the second benefit is he will almost certainly be dealing with conditions of contract in the foreseeable future, though I can't focus on when.'

A strong recurrent theme in his analysis is the extent to which formal structured training is only one part of the knowledge acquisition of individuals in an organisation such as his.

'The next point I wanted to make is that training is partly deliberate i.e. that which results from conscious training, conscious home study, whatever else you might do to become more knowledgeable, and it's partly not structured in the sense that as you do your job you learn things, even if you aren't undergoing any training at all, you weren't trying to get a qualification. If you are doing a demanding job which requires you to take initiative, take responsibility and do quite difficult things you learn a lot as you go. so you take someone and you put him into a new discipline, he learns a lot even if you are not training him. And I think my view would be that the non-structured, on the job, learning without trying to, accounts for the vast majority of useful learning that goes on in the organisation. And the bit that is done deliberately, and structured and imposed upon people, or imposed by their conscious desire to learn is probably only (it's difficult to put numbers on it but) 20% of the useful stuff they learn comes by that route and the rest comes by just doing your job.'

He went on to explain how he would direct specific technical learning as part of a project, and therefore as part of the non-formal activities which can be arranged by managers but which are not easily perceived by trainers.

*'I say to him, 'go away and find out everything you can about this'. And effectively I'm mandating him to spend maybe two days, twenty/thirty hours in the end maybe, researching this quite narrow topic as part of the project work. Now if I authorised twenty or thirty hours of formal off the job training on this particularly narrow subject somebody would say that's a waste of money. But so long as it's an essential part of delivering a project to a client, nobody even thinks about it. And the purpose is to get a contract document not to educate that guy, but as a consequence of what he's just learnt about water-tightness and durability he's just succeeded in writing a short paper to be published in a tunnelling journal in a couple of months, on water-tightness and durability in immersed tunnels. His ability to do that has been driven purely by what he has learnt on this project, he's had no formal structured training on that subject at all it's just come from his work. Because so long as it is part of his work it tends to get large chunks of his time. And also **I feel that people learn best when they have a very good reason to learn.'***

Examples such as this where the demonstration of relevance is clear to the trainee are evidence of the ability to enhance assimilation by a motivating context. In this instance the references to the knowledge being needed by the organisation, the motivating context and the immediacy with which the learning is used, all determine a clear demonstration of knowledge use.

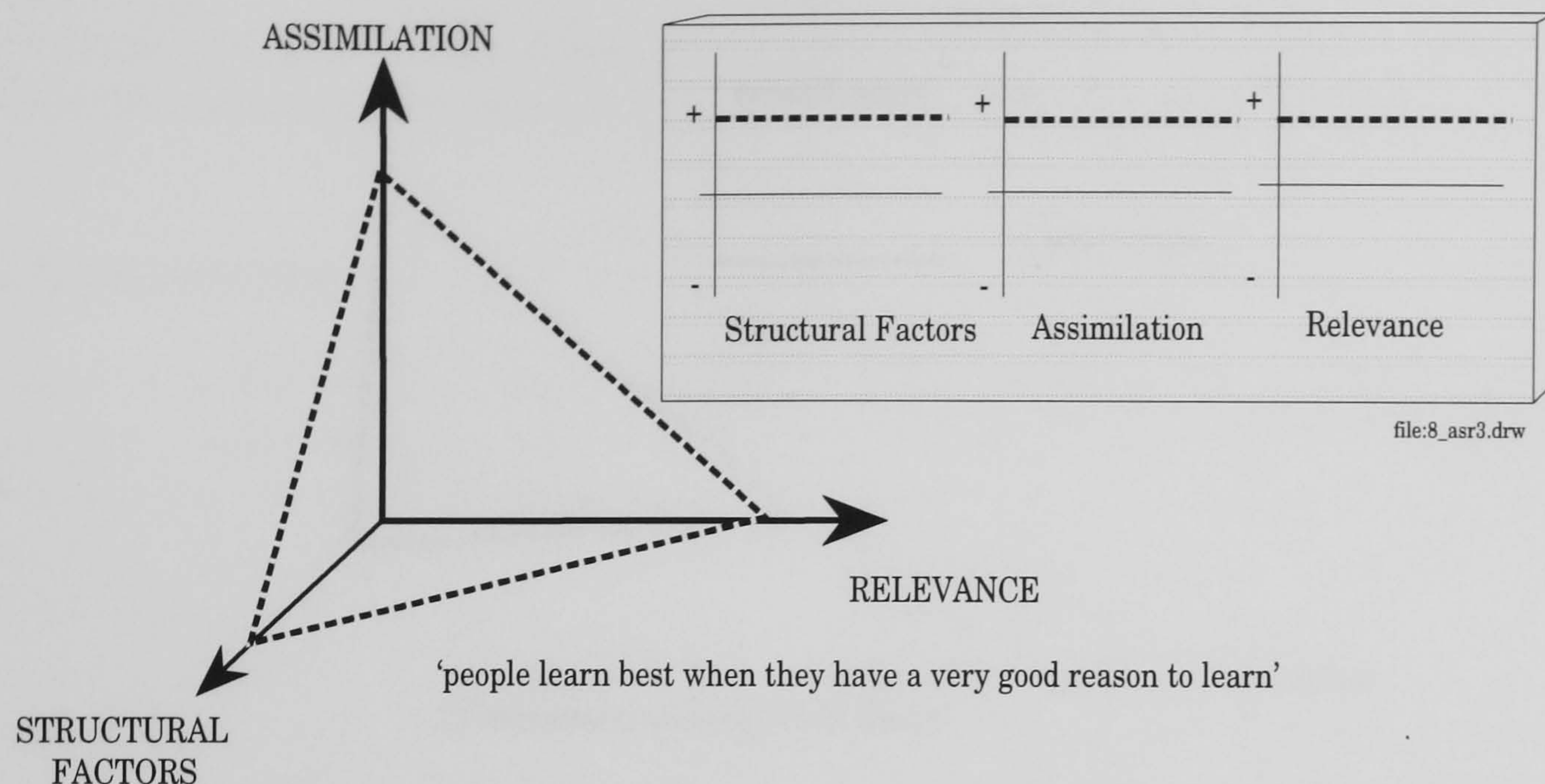


Figure 7.12 Assimilation is improved by motivation

'...I feel that people learn best when they have a very good reason to learn.'

The ability to assimilate knowledge is significantly influenced by the circumstances in which that knowledge is to be exploited. When a learning experience is associated with delivering valued results and the learner recognises this, assimilation is enhanced. When the additional bonus of achieving public or academic recognition for learning is present few trainees will neglect activity, or even let others forget it.

On the issue of the failure of a member of staff to be able to use knowledge acquired from formal training i.e. the issue of relevance the respondent offered the following insight;

'Another situation where information is retained but not used is when the resources or facilities are not available for them to be used. In the case of CAD this has certainly happened. A member of staff goes away in a specialised staff training course, he learns a range of new features and gains expertise, and then returns to the workplace and the equipment isn't available. He is unlikely to remember all that he has learnt without an opportunity to practice, and although he may learn quicker than otherwise when he eventually gets the use of the equipment, the lack of resources prevents him applying knowledge for the benefit of the firm.'

Here the relevance of the training to the firm is confirmed and the assimilation is implied from the statement, however structural factors prevent knowledge use. These may change as resources are made available, though the assimilation or learning recall may be affected, hence the possible shift in the model.

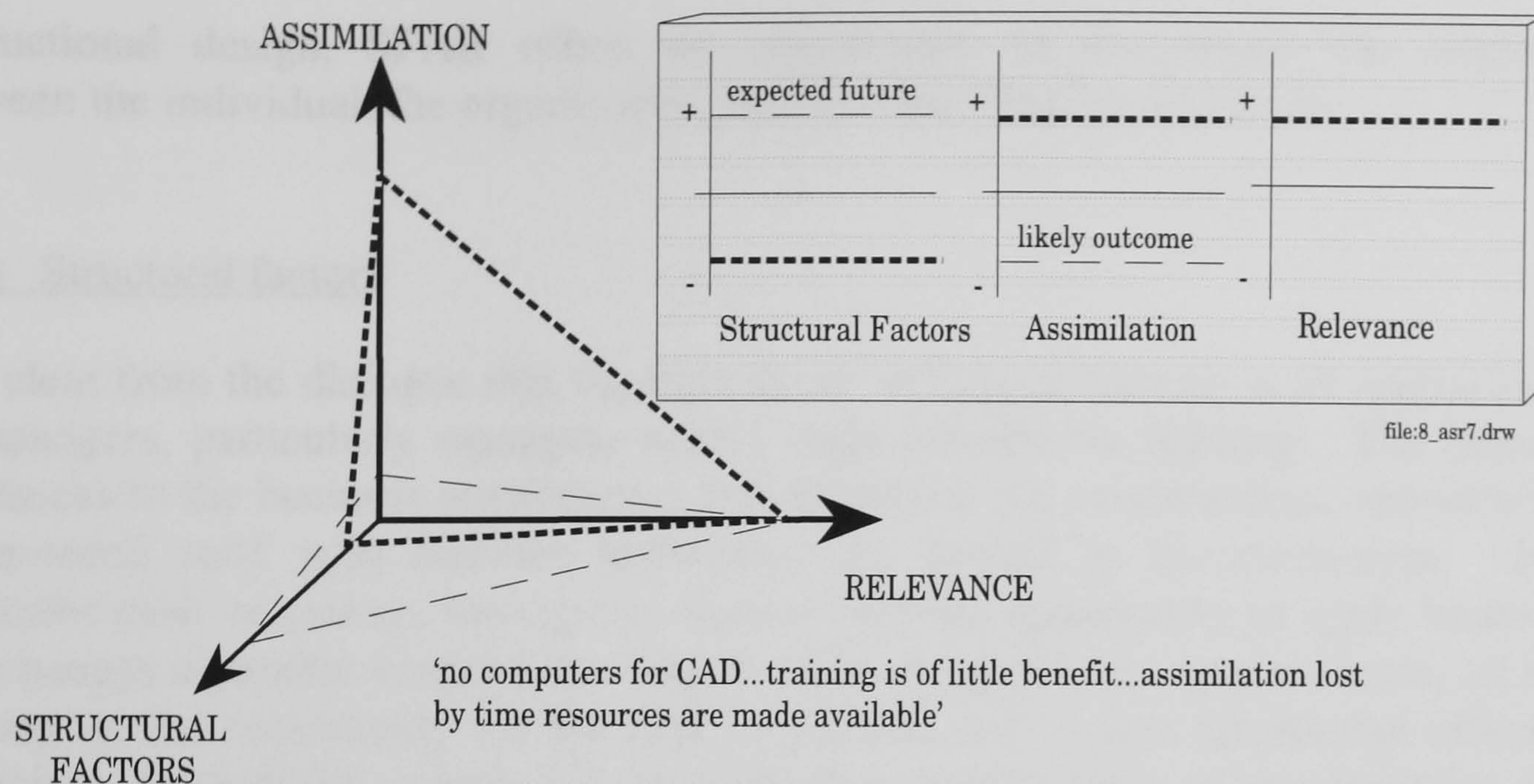


Figure 7.13 Inability to practice technical skill results in loss of assimilation

‘...A member of staff goes away in a specialised staff training course,...and then returns to the workplace and the equipment isn’t available.’

The interviewer questioned whether a lack of resources frequently prevent the application of relevant acquired knowledge and asked whether there any circumstances where the focus of training itself is at question or creates difficulties in knowledge acquisition. The respondent put forward a number of points about the difficulty of using management training and emphasised the differences between the expectations of the training and the needs of the organisation. He offered a quotation from a tutor on a management course involving one of his employees where the trainer recognised that frequently there is a lack of congruence between what the trainee can now offer and what the company is prepared to use.

7.5 Research output

Two significant contributions emerge from this approach to improve our understanding of the managerial problems of exploiting benefits from training. By using the model to raise issues of failure in the training cycle, the interview dialogue allows ‘real life’ managerial concerns to emerge. The opportunity for an interviewee to compare their own model against one from training assists in placing these issues alongside the trainer’s model of learning and knowledge use. Secondly, by interpreting this dialogue from an interactive model that reflects the dimensions of knowledge exploitation a greater understanding can be gained of both the complexity of the problem and the limitations of theoretical structure offered by more commonplace models of training.

The ‘structural factors, assimilation and relevance’ model (SFAR) enables a variety of insights to be gained about both the manager’s perspective of training, as well as the attributes of the model’s dimensions. By interpreting the recorded dialogue through this approach it is clear that each of the model’s dimensions has varied and interactive attributes of interest. Interestingly each of these dimensions are not exclusive to the individual or organisational domain. Unlike the ‘closed’ systemic models of

instructional design, SFAR offers the opportunity to re-appraise the relationship between the individual, the organisation, and the operating environment.

7.5.1 Structural factors

It is clear from the dialogue that the dimension ‘structural factors’ is of central concern to managers, particularly managers with a responsibility for training. The immediate references to the business environment that determine the opportunities and outcome of experienced staff with relevant knowledge are central to the discussion. In this particular case; resources, managerial control over the opportunity to apply knowledge, and changes in market demand resulting in different knowledge requirements, all have a bearing on the opportunity for the firm to provide and exploit knowledge effectively. Moreover, as could be expected in an interactive model, many of the structural factors identified by this manager not only have a direct influence on the ability and opportunity to exploit knowledge, but they have a series of ‘knock-on’ or inter-related effects on the other dimensions of ‘assimilation’ and ‘relevance’.

An example of the interactive nature of this dimension can be seen where problems arise in the provision of CAD equipment for staff returning from specialist IT training. In this case the structural factors not only prevent the opportunity for the immediate ‘physical’ or ‘motor’ practice of these skills, but thereby reduce the opportunity to assimilate learning. This appears to be particularly true for many professional staff working in highly technical areas who adapt quickly to abstract and detailed knowledge when it is used. Many technical staff develop ‘coping’ strategies to accommodate the need to remember large areas of detailed, abstract knowledge. These individual knowledge strategies, often developed by professionals with technical expertise, result in assimilating frequently used abstract knowledge and then selectively relying on reference sources for supplementary knowledge. Here, practice becomes essential to maintain this core abstract of detailed knowledge.

Figure 7.14 summarises the output from the statements interpreted using the SFAR model. From the evidence provided in the dialogue structural factors appear to be different in nature from ‘environmental contexts’ which are used to define the boundary of the training function cited in much of the training literature. Clearly structural factors include and are dominated by external elements outside the training boundary, however, many other elements are neither outside the boundary of the organisation nor outside the appreciation of all managers within the organisation.

Figure No.	Attributes of Structural Factors	Outcome
Figure 7.6	Career opportunities reducing the likelihood of staff remaining in the organisation	û
Figure 7.7	Market needs determining the nature of training specified by the organisation	ü
Figure 7.8	Market changes resulting in change in knowledge requirements	û
Figure 7.9	Knowledge remains of potential benefit but opportunities for exploitation do not exist	û
Figure 7.10	Lack of clarity in determining expected outcomes from investing in managerial training	û
Figure 7.11	Managerial control prevents opportunities for knowledge exploitation by capable staff	û
Figure 7.12	Personal responsibility and market needs increase motivation and knowledge use	ü
Figure 7.13	Lack of (technical) resources prevents knowledge use	û

Figure 7.14 Table of Structural Factor attributes

It is clear that the creation of opportunities to accumulate knowledge are often within the scope of an organisation, yet these opportunities can be significantly influenced by the role of managers. Indeed it appears that wherever external opportunities permit the organisation to enhance cumulative knowledge it is the manager who is best placed to establish and oversee the process.

It appears that the close interrelationships between the influences on individual learning and the opportunities available for a person to learn in an organisation can only be readily observed by a manager in place with an expectation of benefits from this enhanced learning. This appears contradictory to the often centralised and hierarchical provision of training by many organisations.

When one reflects on the formal process of learning provision the discussion in Chapters 2 and 3 concerning knowledge types and learning processes is of interest at this point. By recognising types of knowledge and thus forms of training it seems possible that if a manager is aware of the opportunities and limitations of different knowledge types, their response to these types should match the distinctions made in this chapter between individual learning and benefits to the organisation by knowledge exploitation.

Therefore it is useful now to consider the distinction that an experienced manager makes between forms of knowledge, training types and the opportunities to manage the exploitation of learning.

CHAPTER 8

8. Cumulative knowledge and the managerial role

In Chapter 5 the organisational features concerning type of company, nature of operations, characteristics of the operating market and the autonomy of the manager are seen to be relevant to the outcomes of training in a variety of contexts. To appreciate the relevance of these characteristics it is useful to look at the issues faced by a manager in a large hierarchically structured organisation.

This chapter argues that whilst knowledge based organisations with flat organisational structures, seen in Chapters 6 and 7, are likely to offer evidence of a particular form of knowledge management, it is reasonable to expect variations for firms with differing organisational forms and training types.

The discussion of structural factors, assimilation and relevance (SFAR) in Chapter 7 offers a method of analysing the views of a senior project manager explaining the exploitation of knowledge in the firm. This organisation was largely dependant upon high levels of technical, instrumental knowledge. In this firm knowledge forms were recognised to be of particular benefit to the organisation where they contributed to the cumulative knowledge of the firm. A variety of mechanisms were identified as valuable for achieving benefits from cumulative knowledge, however, these were not always accessible to the manager for a variety of reasons e.g. lack of resources, external pressures on the firm, or the motivations and career paths of his staff. Few problems arising from the hierarchical structure of the firm appeared to influence the managerial opportunities to control and access knowledge. The pressures that were exerted on the firm were largely due to the significant external fluctuations in the company's operating market with these concerns dominating the development of the organisation.

If, as Chapter 2 discusses, learning models of the individual influence the determination of training models. And, as Chapter 3 suggests, cumulative knowledge models do not match those models of training, it is useful to explore the features of this mis-match.

Chapter 3 defines cumulative knowledge as being that learning which is related and available within the organisation. Within this available knowledge it is recognised that certain forms of learning contribute to the technical operations and functions of the firm whilst other forms of learning contribute to the processes of change.

In the previous chapter few opportunities were perceived to be available for staff to contribute to the processes of organisational change and whilst high levels of technical knowledge were demanded by managers, this knowledge was not required within the firm. This chapter provides an opportunity to uncover the individual influences and concerns related to cumulative knowledge and the developmental aspects of this knowledge. The organisation chosen is a large, now privatised, firm in the energy supply sector. Thus, in this organisation it is useful to ask:

What evidence is there that line managers are the primary influences upon individuals being able to contribute to the processes of cumulative knowledge? ... And if this is the case, are line managers not just the best placed but only staff, able to provide an understanding of their requirements for developmental knowledge?

The structure of the chapter focuses on two features of cumulative knowledge: firstly that developmental knowledge, as an attribute of cumulative knowledge, requires line-managerial initiative if it is to succeed, Section 8.2. Secondly, that individual features of training models such as learning style are influential upon the cumulative knowledge process and it is likely that line managers will be the only individuals aware of these differences and their impact upon the performance of that part of the organisation, Section 8.3.

8.1 The organisation

The evidence used within this chapter is drawn from an interview with an experienced senior manager responsible for information systems (IS) development covering a large region of the company's operations. The company is a large firm in the domestic energy supply sector, once a nationalised industry and now operating in the private sector. The firm has a well developed infrastructure for training and human resources development and has continued to make significant investments in staff training. The Manager had recently completed an accredited management course and had a personal as well as professional interest in the research and output of the study. In preparation for the interview, the researcher explained the outline of the research and his particular interest in models of training and learning in organisations.

The interview was structured with reference to the learning models developed by Gilbert (1995), (Figure 8.1 and Figure 8.2). They were used as the basis for discussion so as to elicit issues about knowledge transfer in the organisation whilst avoiding the constraints which accompany more structured examples or questions. In answering the researcher's questions the themes of managerial role and individual influences on the success of learning were evident. These themes form the basis of Sections 8.2 and 8.3.

The output of the interview (Appendix F) is discussed with respect to the features of cumulative knowledge in its instrumental and developmental knowledge forms discussed in Chapters 3 and 4 in the thesis. Within the interview text the Manager provides details of his career, relevant management experience and education. Specific references to the training packages referred are placed within double quotation marks ("...") in the text.

8.2 The managerial role and developmental knowledge

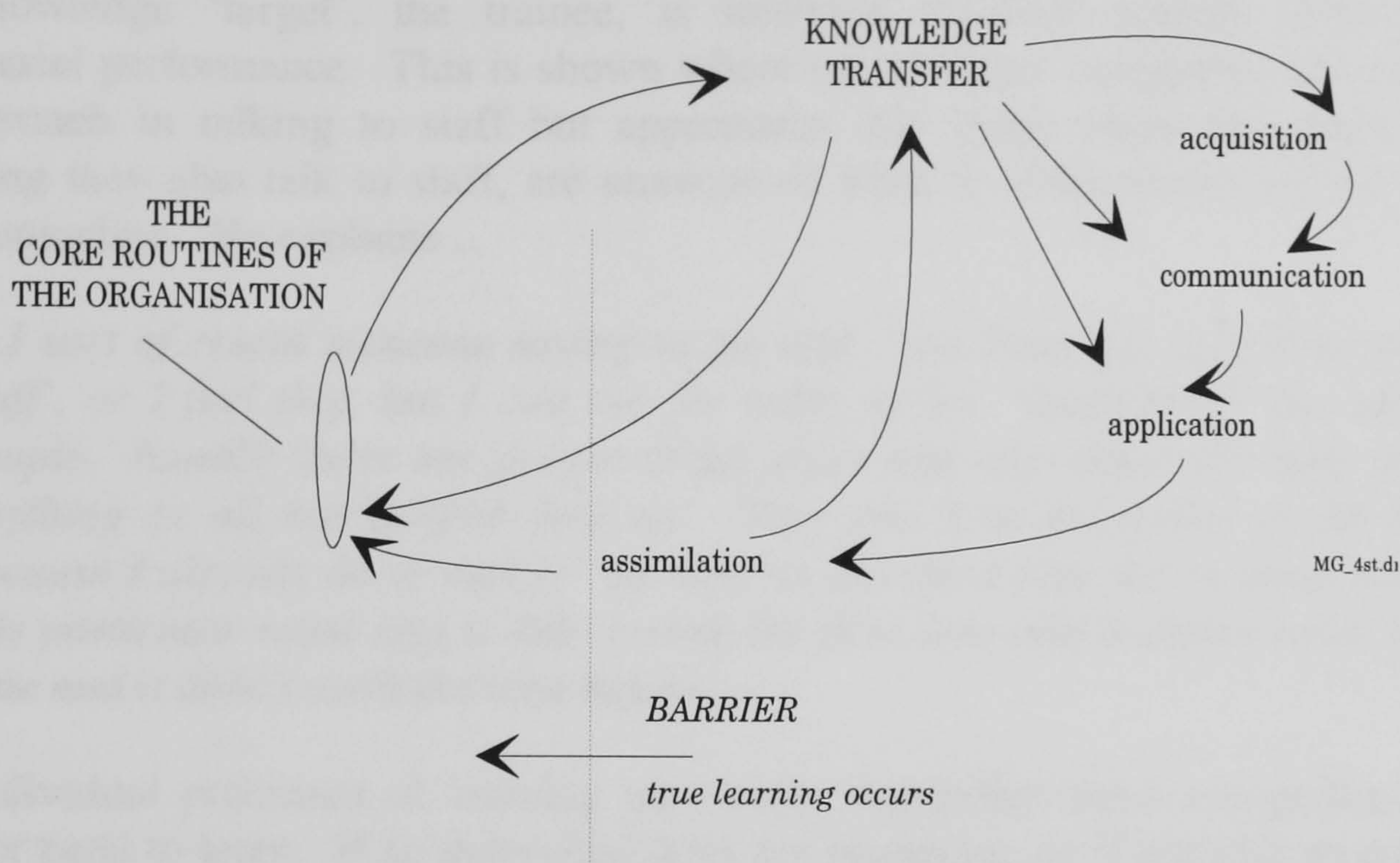


Figure 8.1 The process of knowledge transfer in organisations

When presented with the model in Figure 8.1, the Manager acknowledged the stages and recalled examples where training, intended to contribute to organisational change i.e. developmental knowledge had failed, at least in part, to achieve this objective. When asked about examples of failures in training which had been introduced to achieve specific changes within the organisation the Manager's response was clear. Difficulties with this form of training would be experienced whenever culture change was expected to occur from a distant hierarchical level. The Manager observed...

'One of the things I've seen over the years is that an organisation wants to undertake a culture shift. Now I know all my managers, I can talk to their staff and that ought to be a two way process. I believe that it is really important, if you haven't got the lower levels of management signed on, i.e. if you haven't explained it, what tends to happen is that they go away on a course about team briefing and say, 'this is a load of old piffle'. They come back and I say, 'here you are go and brief your team about this', and it doesn't happen and you go round and round that loop. The Company have done this about three times now. They call it different things all the time the latest thing is called "team talk", but what they have not done is actually solve ... where we want to go and ... why we want to do it...' (Appendix F)

The Manager's references to the need to involve 'lower levels of management' in culture change are clear, as is the failure of culture change training by re-packaging or re-naming it. In his view the expression and explanation of the organisation's objectives are an essential first step in establishing the processes of change. What is not clear from this statement is why involving 'lower levels of management' should be so important, particularly if these managers are a mechanism for communicating objectives which could be bypassed more effectively with other more direct lines of communication. An insight into this issue is gained when the Manager discusses training provision in more detail. This linear communication model of training is dependant upon the staff being willing and able to learn i.e. they recognise knowledge

needs and can learn from the manner in which training experiences are provided. Here it is recognised that the 'one way' provision of information may be inadequate if the knowledge 'target', the trainee, is unaware of their current behaviour or managerial performance. This is shown where the Manager recognises his own style of approach in talking to staff but appreciates that many other managers, whilst believing they also talk to staff, are unaware of what is really meant by the skill of communication. He explains ...

'...I sort of resent someone saying to me that, 'you have got to talk to your staff', or I feel that, but I can see the value in the "team brief" for other people. Equally there are people at the other end who don't tell their staff anything at all but believe they do. They say 'I'm not going to do this because I already do it, and by the way its the third time we've gone down this particular route and it didn't work the first time and it didn't work last time and it didn't work the time before',...

The individual processes of learning are clearly dependant upon recognition of the value or need to learn. If an individual does not recognise, or is not able to recognise their learning needs then re-presenting or repeating the same message will not create an awareness of this need. It is often only by demonstrating the value of certain knowledge forms to an individual that the value in acquiring this knowledge from learning is recognised. By managers offering reasons and justifications for learning that are accepted, it is possible to achieve and motivate change. This is in contrast to individuals being redundant within the change process.

Challenges to the acceptance of learning by the individual can result in difficulties for the specification of training needs from more senior levels in the firm. It is interesting to compare these observations with the Manager's description of changes, initiated by the Company, that employ development training as a module of the change process.

'What happens in the Company is that they say 'this is the grand plan' and instead of doing a development type cyclical approach where you gradually build up on what you have done, what they tend to do is say, 'that's where we want to go and how you do it. We want that, that, that and that' and training is one part of it. It's not part and parcel it's a block that they use. They have done a similar thing with something called "Interaction", which was focused the other way, about staff talking to each other and how they interacted. Again this was, 'we don't think our customer facing teams were talking to the teams at the back to say what they want', ... 'so lets get everyone talking to each other.' Great concept, brilliant but you know it goes off half cocked again. ...

...The one brilliant thing they could have done was to actually mix the interaction groups and say right that's someone who's a customer support rep. someone's a marketing rep. someone's in finance and someone's in IT and mixed it all up that way. But what they did was took ten people out of IT, or finance and said to the individual finance officers, 'right you have got 100 people under you I want ten of them training on this day and ten training on that day.'

By applying training of a 'developmental' type as a discrete block it appears that problems arise more frequently. The presentation of difficulties associated with developmental training may appear to challenge the value of this type of training. If this is true and developmental training is ineffective then considerable resources are being wasted in industry. Certainly there must be benefits from this form of learning for firms to continue to invest and these benefits must be identifiable. The Manager here recognises developmental training as having considerable value even for those not anticipating a managerial role. He shows how the manager's job is made easier by providing his own staff with access to an accredited course in management studies.

'when it comes to management training it's different and I got a lot of benefit ... from sending six people on the NVQ level 4 (equivalent to the certificate of management studies) simply people came up to me and said 'Yea, I understand now, I understand why we did that and I understand this. I want to be part of what you're doing' and that helps me because when you are one manager trying to control ten or twelve technicians it's very very difficult'

In this example the response from technical staff, whose working practices normally do not demand an appreciation of the managerial role, was a distinct encouragement for the Manager. By understanding the context the value of managerial knowledge was gained even though the trainees did not need to apply it immediately in their own job.

It is important to build upon these examples to understand why problems occur in the use of developmental learning. It would be simple to assume that all training specified from 'the top' will fail and training promoted by line-managers will succeed, indeed examples of the divide between technical and developmental knowledge requirements often appear to support this. The Manager explains, when referring to the senior management specifying training at differing levels in the organisational hierarchy,...

...That this does not tend to happen with technical training perhaps because technical training is very much at a lower level of the organisation. You rarely get chief executives saying I want one of my staff trained in accountancy or IT or whatever. That tends to be a decision of lower level management. ... 'I want one of my people trained in "team brief"', then that usually comes from the top.

The statement summarises a familiar 'divide' in training specification. However, this is only the symptom of failure, it does not uncover the mechanisms by which failure occurs. The mechanisms by which training failure occurs need to be explained beyond classifications of failure or success. If organisational hierarchy were the only determinant the majority of training functions within organisations would be quick to seize upon the relevant hierarchical levels for success to be achieved. It appears from the previous examples that the training centred view of knowledge provision is unable to provide greater insights as to why some forms of knowledge are exploited and others are not. By shifting the analysis from one of a training failures perspective to that of cumulative knowledge and managerial role further insights can be gained. The issues of developmental knowledge are now explained further.

8.3 The contribution of individuals to cumulative knowledge

Section 8.2, shows how individual responses to learning can be influential for organisations acquiring developmental knowledge. The managerial insights on knowledge of the individual are clear ...

'you get all sorts of people at that particular level. You have to take a view on that (person by person ? - Researcher) yea, but I think what you have got to say when in an organisation, if you've got a particular level of management you've got to have some sort of integrity. If I say I want all your staff trained in the best way you see fit, best value for money and I want them taught about the knowledge at the end of it. Then, that person has probably got the best knowledge about those individuals within the organisation.'

The Manager's knowledge of his own staff is a fundamental contribution to the firm's knowledge at this particular level of the hierarchy. If the Manager has gained knowledge of his or her staff's abilities this is the starting point for a commitment to recognising knowledge needs. It is useful to recall that references to developmental knowledge imply that the individual will contribute to the processes of change. This contribution is in contrast to being a passive recipient of change. The Manager will require knowledge contributions to achieve organisational change and in such cases staff are influential in contributing to the viable pathways for the organisation.

Returning to training, or formal learning, the question remains; what learning value is there in a manager gaining knowledge of his or her staff? This Manager provides illustrates the differences in learning style between individuals. A well equipped manager with the knowledge to recognise the learning style of employees is able to adapt the efforts and selectivity of learning experiences to match individual needs. To...

...take a very trite example- PC hardware. One individual goes out on a course and comes back home with the box and takes it apart, no problem. Another person will go there come back and say 'Ah there's the box there I'm not going to work that, I'll wait until somebody else comes and then I'll have a peer,' and sometimes, in my experience that individual's no better off for having been on a course because you can say to them the next time somebody opens the box, 'do you want to have a peer, do you want to want to get involved' and they say, 'yea'...

The ability to recognise a lack of confidence in learning is not unusual amongst selected individuals. As learners we can all identify strengths and weaknesses in our knowledge base, though often the means by which we can overcome these 'gaps' are unclear. By understanding the processes of individual and organisational learning a manager is better equipped to compliment both processes.

In an organisation that uses managerial knowledge such as this to guide learning achievements the effective successes of learning are known to the manager as well as to the organisation. In other organisations systems have been established to ensure that successful learning is recorded and available to managers of recently relocated

staff, thus ensuring the continuity of value from learning i.e. cumulative knowledge. An example is offered by the Manager from early employment experience within the civil service.

'with the civil service your career, your training ... followed you right the way through ... your training record was 'hung around your neck'.'

he explained how this principle was employed...

'being a personnel manager I was aware that you had two files, you had a file which is all about yourself and another file which is about when you joined, all the courses. Every time you do a course you fill in a record, this should go into this record file. Because of how the civil service works and says OK you're good at it now so we'll move you over there and see how good you are over there. They especially do it with the younger staff, for a potential employer, and that's the way it is looked upon they say well OK what does he know, and they say OK he's done this and this job and he's been trained in that and that.'

Clearly it is possible for organisations to include simple systems that recognise the knowledge of individuals and managers and is able to provide insights into learning styles, the appropriateness of differing training types and previous experience. Using simple methods it is possible to record the proven contribution that individuals are able to make to the processes of change as well as their technical proficiencies. This assumes that the organisation places a value on cumulative knowledge.

At this point the researcher introduced Gilbert's (1995) 'five stage learning model'. The distinction that is made within this model is the need for acceptance, as an organisational process, to occur within the overall process of knowledge transfer in a developmental context. The interest to the researcher was in focusing attention to the stages within the model and the differences between individual and organisational learning processes.

It was interesting that the Manager saw the process stages of the model as being familiar to experiences obtained from managing staff in a variety of organisations, but that the role of individuals within this model differed somewhat. He recognised that individual assessment and acceptance of knowledge is clearly key. This is a more significant problem than one of merely delivering knowledge, of any form, for acquisition by the learner. The Manager was clear that 'acceptance' as a stage in the process, in contra-distinction to the organisational learning model, occurred at all stages in the individual knowledge transfer process.

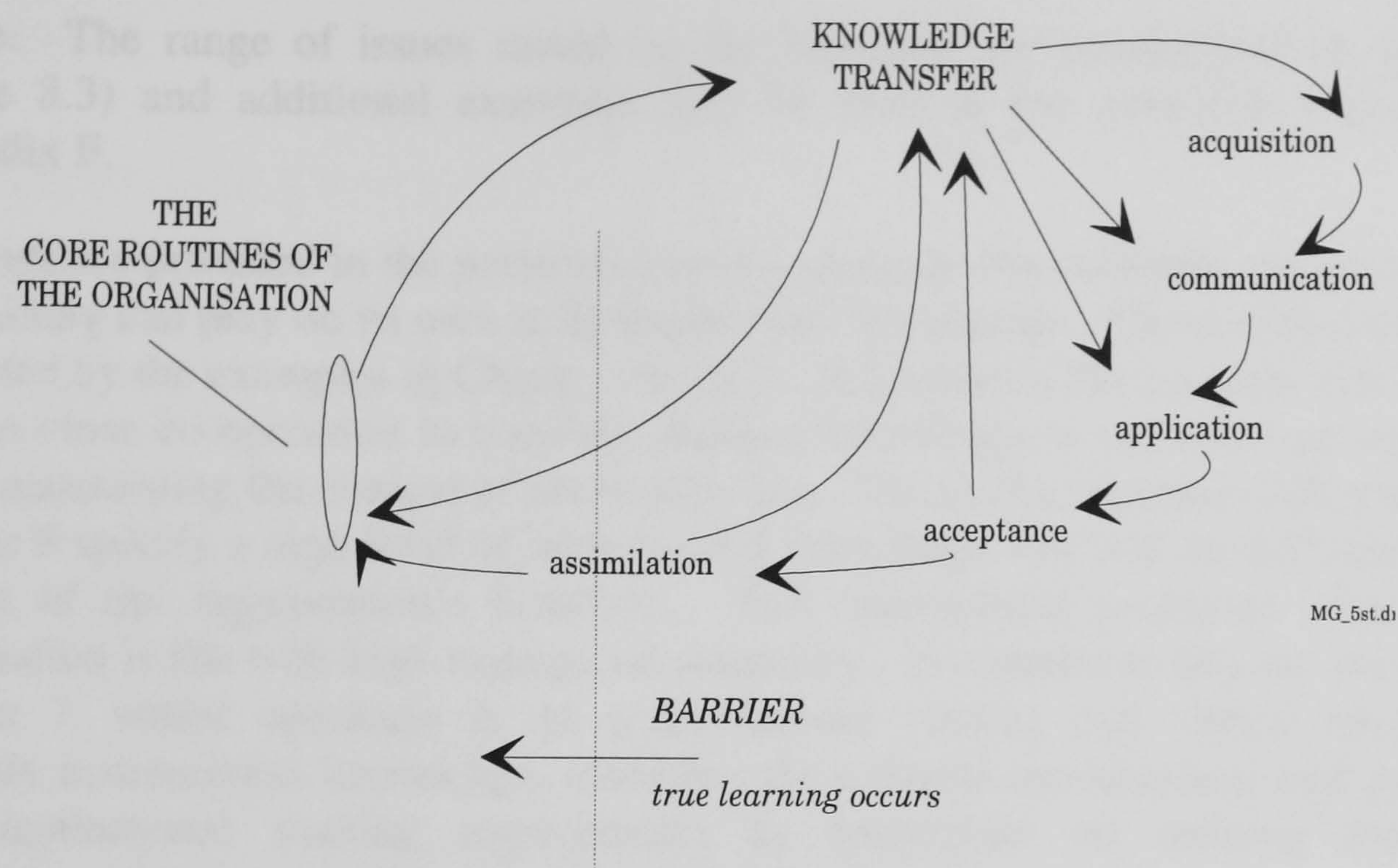


Figure 8.2 The five stage model

‘ ...‘acceptance’ can happen here - you can say no I’m not doing that or ‘well that was rubbish and I’m not doing that’ I’ve seen that happen and even ‘well now I have the skills I am going to ‘communicate’ them to everyone in the department, they all think its rubbish and therefore that modifies me’ and I’m perhaps one of those. If ten of my colleagues are telling me that’s rubbish then I need to re-evaluate it...’

From these examples of the interplay between individual and organisational learning the complexity of the process is clear. This Manager’s experiences of learning in organisations show that it is possible to acquire a wide variety of knowledge forms but that the role of the individual and managerial context are significant to this process. At this point it is useful to summarise the points raised by the Manager and consider these with respect to training and cumulative knowledge.

8.4 The limitations of the training context

instrumental	knowledge type	developmental
rarely specified by senior management levels		more frequently specified by senior management levels
	influenced by learning style and can be enhanced by appropriate context	
commonly offered managerial autonomy		requires managerial autonomy for effective benefits
wider organisational benefits would be simple to identify by senior management		knowledge of training experiences less relevant to senior managers

Figure 8.3 Summary table of managerial training issues

In the light of the issues raised in Chapters 2 and 5 the evidence provided from this manager’s experience show a number of failures in the process acquiring cumulative knowledge from formal learning methods. It is clear, however, that in certain circumstances training can contribute significantly to the processes of organisational

change. The range of issues raised by the Manager are summarised in the table (Figure 8.3) and additional examples may be seen in the interview transcript in Appendix F.

The evidence provided in the previous sections illustrate the valuable, yet limited, role that training can play on its own in developmental knowledge. These observations are supported by the examples in Chapters 6 and 7. In Chapter 6 the manager and trainees work in close co-operation to translate implicit knowledge to explicit learning forms whilst maintaining the context of knowledge use. The staff concerned with training in Chapter 6 specify a high level of instrumental knowledge that will be delivered in the context of the organisation's functions. Few hierarchical problems arise as the organisation is flat with high managerial autonomy. In contrast to this the manager in Chapter 7, whilst operating in an organisational context that almost exclusively demands instrumental knowledge, identifies the external environment and pressures from institutional training requirements as constraints on training that have similarities with the manager's experience in this chapter

It appears from these examples that training as a formal method of knowledge provision and acquisition is often an unsuccessful process when managerial autonomy is constrained.

CHAPTER 9

9. Findings and Conclusions

9.1 Contributions from the research activities

This chapter draws upon evidence from the research activity in Chapters 2, 3 and 5 to 8. It uses the conclusions from each of these chapters to consider the implications for training and the management of formal learning in organisations.

Chapter 2 presents the major concerns and models of training so as to make explicit the extent to which formal learning provision contributes to organisational performance and to organisational change.

Chapter 3 reviews the literature and concepts that focus on the role of knowledge as a cumulative process in organisations. It draws upon research into technological innovation and looks at the value of technology transfer models as models of knowledge provision and use, and the more recent models that focus on non-technology based innovation and organisational development.

The function of Chapter 5 is to explore training issues from a variety of perspectives with the particular interest of uncovering training issues across the breadth and diversity of organisations. This activity is interesting in that, as diversity of training issues are encountered, a structure in the variety of organisational attributes begins to emerge when considered from the perspective of cumulative knowledge in organisations.

The difficulties experienced by organisations in attempting to train individuals with specific requirements for knowledge (or training types) are summarised from a training perspective. This provides the basis from which to investigate managerial issues and organisational structure. The limitations of managerial autonomy of managers in structuring the work environment for staff shows significant consequences for individuals' opportunity to provide learning benefits to their organisation. The organisational learning difficulties observed in organisations also show that the functional typology of training is related to the outcomes of training in achieving organisational performance benefits from that learning.

Chapter 6 uses a research activity based on training design and investigates the considerations taken into account by a manager of an organisation which is at the 'knowledge based' end of organisational classifications. A significant issue within the thesis is that, where knowledge requirements are low and instrumental, it may be possible for organisations to define appropriate learning experiences of benefit more easily. However, it was anticipated that it would be more difficult for training staff to develop curriculum and assessment planning without a structured input from managerial levels in an organisation where instrumental knowledge levels are high or developmental knowledge is required. This emphasises the need to identify and translate defined managerial needs into training needs.

Chapter 6 thus provides an understanding of the opportunities and problems that arise when a training curriculum is designed to ensure compatibility between the organisation's needs and the training function. The organisational changes that result in a need to shift from the tradition of 'sitting with Nellie' to a planned programme, also had consequences for the specification of job and training performance indicators. These were needed to assess the appropriateness of the training provision and to guide trainees through a route to 'professional', standards in the case study organisation

By focusing attention on the process of training design in an organisation Chapter 6 provides evidence of the significant role that a manager plays in recognising the organisational knowledge needs of the firm. This is an unusual organisation with its particularly flat hierarchical structure and provides an opportunity to study the process of training design and managerial roles whilst excluding many of the side issues arising from more complex organisational structures

From this research activity a distinction can also be made between learning models of the individual and those of the organisation. This is evident where managers distinguish between the assessment of an individual's performance on the one hand and qualities desirable for the organisation, such as ethos, on the other. The example in Chapter 6 shows the issues faced by a manager in translating ethos and implicit knowledge into explicit learning requirements. It is clear that the manager must take account of the process of learning, the learner's 'understanding' context and the translation of 'context' into concrete learning experiences. These considerations are evident even for an organisation largely seen to be using instrumental knowledge, albeit at high levels. For this reason it is then useful to ask if clear distinctions can be made between training design models and the knowledge requirements of managers. If this is the case, then to what extent do the training issues identified in Chapter 5 represent the concerns of line-managers?

Knowledge based organisations are of particular interest within this thesis and Chapter 7 identifies the evidence of influences external to the company upon a manager's autonomy to manage the context in which learned knowledge of the individual is used and their discretion to optimise the provision and use of knowledge within the firm.

Chapter 7 uses a model of training issues structured from a 'training centric' view to elicit the managerial concerns of someone faced by with responsibilities for both the training of staff within his organisation as well as staff performance. As a senior project manager with line managerial responsibilities for other project managers and junior staff, the manager has additional responsibilities for the allocation of staff training resources. This position represents the coincidence of responsibility for performance with that of achievement in learning. This enables the concerns, compromises and limitations placed upon managers when attempting to maximise the benefits from training investment to be identified

In this research activity it is evident that the manager's responsibility, as well as motivation, is to maximise the exploitation of investments in learning whilst maintaining sight of the organisational long term objectives and those of his staff. As knowledge exploitation is a primary concern of managers a model of individual

knowledge exploitation is used within the Chapter to interpret the managerial concerns elicited with respect to the organisation.

The model uses three dimensions of individual knowledge exploitation (see Figure 9.1). Each dimension may be considered to have a variety of attributes and these are discussed using the examples drawn from this research activity. One dimension of the model represents the attributes that arise from an organisation's inability or unwillingness to change organisational structures that prevent knowledge use. These 'structural factors' refer to the organisational features which impinge upon an individual's freedom or motivations to use what is learnt.

The term 'assimilation' is used in the model to refer to the take-up of knowledge by an organisation into established procedures. However this Chapter makes a distinction in the use of this term between the characteristics of human learning within the exploitation model, and the acceptance and routinisation of procedures that are taken to represent learning from an organisational perspective.

'Relevance' is the dimension in the model is used to refer to the congruence of knowledge between what the manager recognises is needed and what is acquired by the individual. Mis-specification of training needs would be an example of irrelevant knowledge.

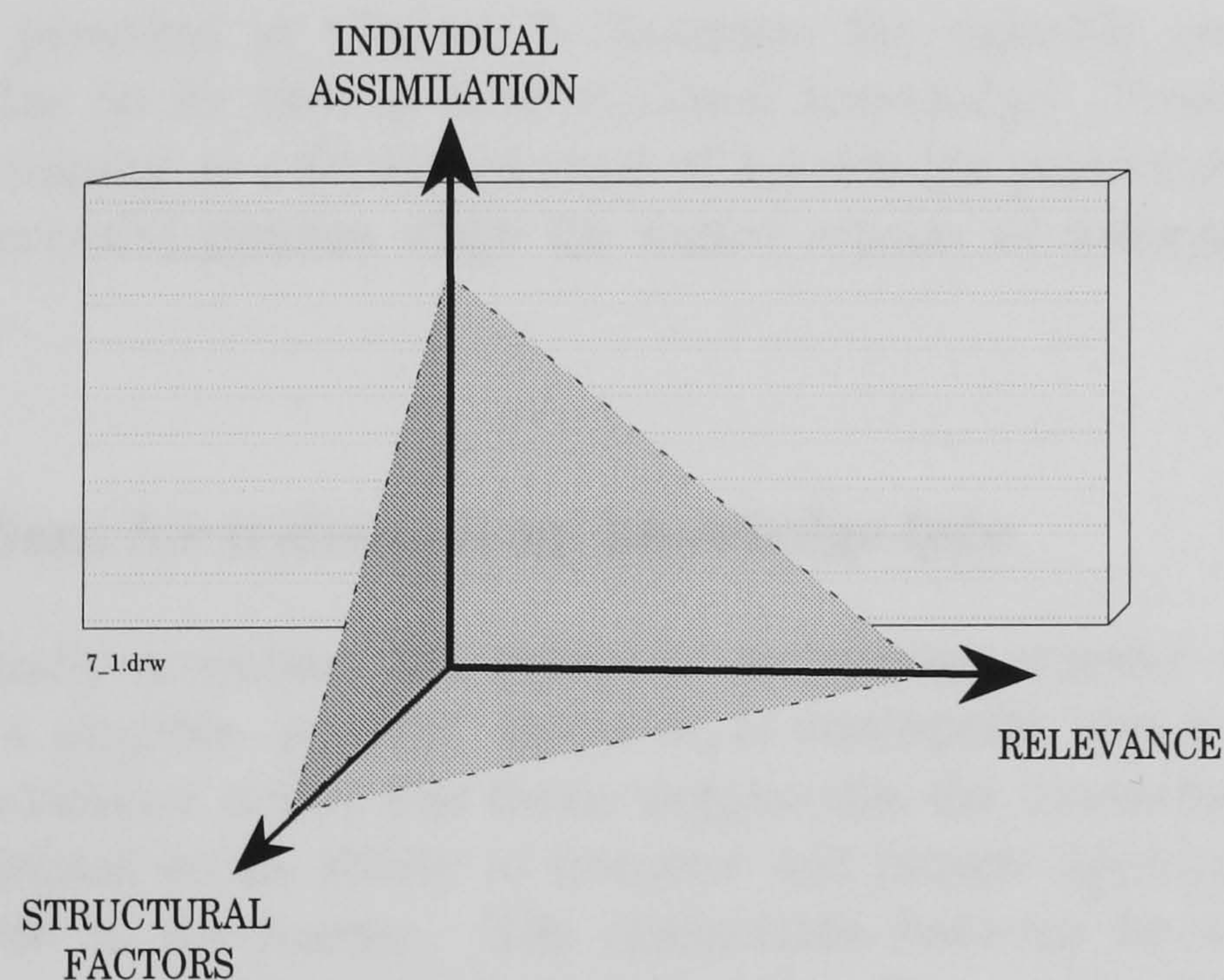


Figure 9.1 Knowledge exploitation: Structural factors, assimilation & relevance

This conceptual model, Figure 9.1, enables a representation of the limitations that exist in the use of evaluative models for organisational benefit. For models which have 'training perspective' origins it allows an exploration of issues in training management. The model focuses specifically on the exploitation of knowledge to benefit the organisation.

The work within Chapter 8 tests the idea that it is important to discriminate between organisational needs for knowledge, the managerial role in determining the correct specification of knowledge, and the extent to which learning models of the individual

differ from organisational learning models. The distinction made within the Chapter is that whilst a knowledge based organisation with flat organisational structure, as seen in Chapters 6 and 7, are likely to offer evidence of a particular form of knowledge management (and thus implications for training), it is reasonable to expect variations for firms located within the taxonomy of differing training types and organisational form, as found in Chapter 5.

Chapter 8 addresses the following issues:

To what extent are line managers the primary influence in enabling individuals to contribute to the processes of organisational cumulative knowledge?

And thus, to what extent are line managers the best placed staff to provide an understanding of their requirements for the developmental knowledge that is central to the processes of change.

The chapter focuses on two features of cumulative knowledge: firstly that developmental knowledge requires line-managerial initiative if it is to be successfully exploited. Secondly, that individual features of training, such as learning style, are influential upon the cumulative knowledge process and thus it is inevitable that line managers will be the only individuals aware of these human centred differences and their relationship to the performance of that part of the organisation.

The evidence provided in Chapter 8 illustrates the valuable yet limited role that training can play on its own in developmental knowledge. From this Chapter it is apparent that training as a formal method of knowledge provision and acquisition is often an unsuccessful process when the varied aspects of managerial autonomy are constrained.

9.2 Implications for training from knowledge type

This thesis closely associates the notion of technology transfer with that of either knowledge in a tangible 'product' forms or as conceptual 'processes' of thought or method. The evidence within this thesis suggest that the conventional perspective of training is restricted by its ability to interpret and present appropriate knowledge in forms accessible to the learner. The distinctions between knowledge type are of particular relevance in the training context when the process of formal learning is considered with respect to organisational form and managerial structure.

Within the references to literature in Chapters 2 and 3 and the research activities in Chapters 5 to 8 a recurrent theme within the research is that of the distinctions between forms of knowledge and their relevance to organisations. These distinctions are discussed here with reference to the output of the research activities.

9.2.1 Instrumental and developmental knowledge

The research has used the notions of *instrumental* and *developmental knowledge* from knowledge transfer concepts developed by Gilbert (1995). The term instrumental has

been used when referring to *'the knowledge that is necessary to do the job'* (ibid.). Developmental knowledge is used to describe *'where there is opportunity to enrich and enhance the structural knowledge, this includes the field of personal development'* (op.cit.). The properties of developmental knowledge, of which 'structural' knowledge is a sub-set i.e. an understanding of the variety of forms, shape and processes of an organisation's performance, are central to the ability of individuals within the firm to contribute to the creation and maintenance of an adaptive organisation (see Section 9.2.5).

Chapter 8 refers to the lack of awareness that senior managers, remote within the organisational hierarchy, may have about the necessary stages in achieving a culture change. Such examples of training failure use the knowledge focused interpretation of developmental knowledge to provide insights into the difficulties of establishing change from a hierarchically driven training perspective. In such organisations the knowledge required to successfully translate performance objectives into procedures for organisational change are clearly overlooked on a number of occasions. This can be seen in Chapter 7 where the project manager recognises a lack of managerial developmental knowledge in the need to provide structural change alongside formal training. He says:

'Another situation where information is retained but not used is when the resources or facilities are not available for them to be used. In the case of CAD this has certainly happened. A member of staff goes away in a specialised staff training course, he learns a range of new features and gains expertise, and then returns to the workplace and the equipment isn't available. He is unlikely to remember all that he has learnt without an opportunity to practice, and although he may learn quicker than otherwise when he eventually gets the use of the equipment, the lack of resources prevents him applying knowledge for the benefit of the firm.' (Chapter 7)

The difficulties in providing developmental knowledge from within the training function are a frequent feature of the thesis. In Chapter 7 the Manager observes the problems supporting management training in the context of an unstable operating environment:

'I think probably at every stage in the model the biggest lines are doing this- (sketches environmental impacts on the model (Figure 7.3)), things outside of this picture as you have it.' [This picture illustrates the strength of external influence]

and problems in identifying the value of this training suggest that developmental knowledge is difficult to specify and support from the training perspective. Frequently these difficulties are seen as a failure to supply training resources within the organisation. This results in training provision being delivered out of the context of the firm, an interesting consequence of the mis-match of training specification.

9.2.2 Technical and technological knowledge

The issues of knowledge type, organisational form, and processes of change are more accessible when a single dimension of technical change is considered. Here the term 'technical knowledge', is used to refer to the understanding of devices and techniques within mechanical and applied sciences, simple interpersonal skills or administrative tasks. However, knowledge of a technological form defines the social and organisational as well as applied scientific understanding necessary to achieve successful technical change in products and processes. Technical knowledge can be seen as a sub-set of instrumental knowledge, and technological knowledge as a sub-set of developmental knowledge in that it involves 'receptivity' (Trott, 1992) and 'absorptive capacity' (Cohen and Levinthal, 1990).

The companies researched in Chapter 5 that are involved with the fault-finding and diagnostics project evidently have inadequate technological understanding to achieve technical change and to adapt to this new form of knowledge. The flexibility of such organisations, i.e. their possible opportunities, are constrained by their lack of knowledge about the particular change processes that would need to be available to pursue those opportunities

Frequently the processes of technological change are specified only in terms of discrete technical components or activities in which technical training is often a part. The senior manager in Chapter 8 observes this phenomena in the repeated failure of IT systems introduction. He notes this distinction between technical and 'technological':

'With IT it seems to be 'we'll buy the flavour of the month, we'll initial it,' but then it all falls round their ears and then they'll think about the process - how they should have installed it in the first place - and then they say 'we have a project.' This isn't just the Company - the computer papers are full of it.' (Appendix F)

This recognition of the difference between the technical features of a system and the processes of establishing such a technical system are critical in determining the extent to which training, on its own, can contribute to the processes of change and capabilities of the individual to contribute to such change.

9.2.3 Knowledge use and usefulness

This set of issues is concerned with 'failure' in the use of knowledge from conventional training within the workplace. It recognises that in many circumstances:

'...This (failure) appears to be evident often when training is directly targeted to meet conventional functions of task related training in an organisation such as the training of employees in production skills and management. However these training problems are not exclusive to the routine functions of an organisation alone. Whenever training is used to contribute to organisational development it appears that considerable difficulties exist in targeting and identifying the benefits...' (Chapter 4)

By considering the role of knowledge from training and evaluating its benefit as one would for a production function, the measure of its contribution to organisational performance is confined to the immediacy of its improvement to the routine productive or administrative functions of the organisation.

Access to the companies involved in the fault-finding and diagnosis study in Chapter 5 was negotiated on these grounds i.e. in the expectation that the training experience would immediately improve the performance of 'trouble-shooters', the measure that is most commonly for determining benefits from training. Indeed in some cases this was regardless of the organisation's accommodation to the training package:

'(the Manager to employees) You can take these packages and read them (talking to the trouble-shooter), ... but don't expect to do it here, at work!'
(Craig, 1992)

Often the direct assessment of training is in routine task optimisation, such as the DIY retail group in Chapter 5, where speed of operation at the cash till is a major feature of training. This proves to be appropriate where routines are not expected to change without further training, and when adaptation is not considered to be an issue within such learning provision (see Section 9.2.5).

Difficulties can arise however where an organisation, previously focused on optimisation of routines, has to cope with rapid change. An example of this is the plastics profiling company in Chapter 5 whose difficulties arise from having knowledge requirements that were originally focused solely on production and cost optimisation. As changes occurred in the market environment, driving change within the work place, the introduction of quality standards was required. These improvements demand the operation of quality control at the 'operator stage' with the principles of critical assessment proving difficult to introduce. In this case there had not been an expectation that knowledge in the form of critical judgement would be required amongst the operators and the ability to put it in place had not been developed.

The 'usefulness of knowledge' is a term derived in this research that recognises that learning provides capabilities. These capabilities can be for current use or in the future e.g. for adaptation to new opportunities. The term reflects the prospective or future value of knowledge and the value of adaptivity to the organisation (see Section 9.2.5.). In cases where prospective value is expected it may also be possible for a line manager to recognise elements of current value. The senior manager in Chapter 8 notes:

...I got a lot of benefit ... from sending six people on the NVQ level 4 (equivalent to the certificate of management studies) simply people came up to me and said 'Yea, I understand now, I understand why we did that and I understand this. I want to be part of what you're doing'... (Chapter 8)

In other cases the prospective value of knowledge can only be anticipated even though the manager may know it will be used :

'... if somebody seeks training in the Health & Safety area or training relating to new government legislation, new legislation has just come out, the construction, design and management regulations which are all H&S and there are courses running on that at the moment, and I can't turn-down someone who wants to go on a course for that because it will undoubtedly add to our marketing effort.' (Chapter 7)

It is this feature of 'usefulness' without reference to immediate operational need which many forms of management training, and learning focused on developmental knowledge, attempt to address. Yet this type of knowledge is both 'contextual' and 'temporal' in nature as it depends upon use in the right place at the right time in order to benefit the organisation. For this reason it is difficult for the conventional training ethos within organisations to both specify and evaluate this form of knowledge.

9.2.4 Knowledge exploitation and assimilation

The SFAR model in Chapter 7 is used to identify features of knowledge exploitation in an organisation. Knowledge exploitation is dependant upon structural characteristics of the organisation, such as the availability of resources to utilise skills learnt or the managerial authorisation to employees to use new learning as opposed to being under strict direction from another person. In addition the acquisition and understanding of learning and the appropriate context or timeliness of learning are essential in order to enable the effective exploitation or use of knowledge. These three concepts, structural factors, assimilation and relevance, are used within the thesis to demonstrate the furthest extent to which the organisational features of knowledge can be taken account of from the conventional training perspective. The combined concept of knowledge exploitation thus represents the integration of individual models of learning as well as the organisational context in which they operate.

It is evident that the evaluation of 'assimilated' knowledge can not be undertaken from the conventional training perspective to determine the benefits of these cognitive processes to the organisation. The term 'assimilation' is also used within the thesis to refer to the organisational effects of knowledge gain. By adopting new routines in the organisation, as opposed to optimising existing routines, the knowledge is embedded in the organisation's identity and evolution. The distinction between individual assimilation as a cognitive process and organisational assimilation is important in recognising the similarities between models of knowledge exploitation and training delivery models as well as the differences between individual learning experiences and those of the organisation.

9.2.5 Adaptivity and flexibility

The concept of adaptivity derived from cumulative knowledge models refers the ability of an organisation to take up new opportunities. The range of opportunities available to an organisation is described as the flexibility of that particular organisation. As Jeffrey (1995) in his recent research observes:

'... results provide evidence for a distinct management style associated with the promotion of flexibility. The characteristics of this approach include informal information gathering and an emphasis on human centred organisational qualities. The study's findings suggest that under turbulent operating conditions, the management of attributes rather than of end states or particular configurations may be of benefit to organisations seeking to maintain options for change.'... Jeffrey (1995)

The extent to which conventional training is able to provide learning experiences that enhance adaptivity is of particular interest in this research. It was proposed that structural features of the organisation and managerial autonomy were key attributes essential to facilitate such learning experiences. The research output in Chapter 5 - Fault Finding and Diagnosis, and Chapter 8 - Developmental training, provide considerable evidence for this view. For learning provision to adequately develop adaptive behaviours, the delivery method for the relevant knowledge must provide the appropriate opportunities. Wherever developmental learning experiences are isolated from the managerial context of change it appears that such learning provision cannot normally result in successful knowledge exploitation from the training function.

9.2.6 Cognition and structure - individual and organisational assimilation

Individual assimilation refers to the human process of cognition and, just as comparisons are made between human cognition and organisational structure, organisational assimilation is a metaphor for describing organisational change as a result of learning. Such change, as with individuals, are likely to be most obvious where behaviour, or in the case of organisations, structural changes can be observed. However, in addition to changes in internal structure, mechanisms for making learning available within an organisation are relevant as attributes of organisational assimilation.

Approaches to understanding individual cognition are elegantly summarised by Meadows (1993):

'... there are a number of problems in the background, stretching right back to psychology's unresolved tension between its two definitions as "the science of mental life" and "the science of behaviour". At one level cognition is what people can be observed to do when they have to think, learn, remember, understand, judge, use concepts and so forth; at another it is the system behind these different abilities. Researchers focus on one level rather than another, just as they differ on whether they attend to the formal properties of a cognitive system or to the material it is made of, when seeking to explain why it works as it does.' (Meadows, 1993).

Within the thesis an important distinction is made between *individual learning*, the unique internal processes of one person's cognition, and the *learning individual*, the independent actions of a person seeking, acquiring and assimilating knowledge. This distinction is helpful when translated to the organisational context. Here the concept of *organisational learning* - describes the internal processes of knowledge acquisition, communication, application, acceptance and assimilation. Unlike the parallel

example of individual assimilation this can be observed from the establishment of routines, revised operations and developed procedures i.e. the visible signs of change. The notion of a *learning organisation* has recently been used in management research to describe the independent actions of an organisation seeking, acquiring and assimilating knowledge. This analogy infers that the organisation is acting with its own determinism and anthropomorphic identity. Such a description is unhelpful if an organisation is considered, as in this thesis, to be a product of the synergy and emergent properties of the individuals within it since it deflects the focus of attention from the developmental contribution of the individual.

9.2.7 Relevance and Acceptance of Knowledge by the Individual and Organisation

Relevance of knowledge held by the individual from an organisational perspective is a direct measure of the organisation's current and future knowledge needs. Relevance of knowledge from the individual perspective is a judgement based on that person's motivations and interest in a given context. When related to learning experience these, often implicit, judgements can in some cases determine motivations to learn and remember. Because this is an individual's perspective it does not necessarily take account of the organisation's needs.

For the individual, knowledge acceptance is a function of the relevance, value, acceptability and interest of learning experiences. Organisational acceptance is the translation of knowledge into the routines of the firm. Again it requires judgements to be made about the relevance, value, acceptability and interest in knowledge but can only reflect current requirements as revealed by acceptance or 'take-up'. If knowledge cannot be accepted in the organisation in some form it may remain with the individual until conditions are suitable or is lost.

Relevance and acceptance are both comparative terms when considered from the point of view of the 'actor', either the individual or the organisation. These attributes are of particular interest in the learning context where judgements are made about both the individual and the organisation. Here, the relevance and acceptance of learning provision are influential for successful organisational learning to take place.

Within the research activities a starting point for the analysis of training failure has been the identification of the mis-match between the learning opportunities of individuals and managerial autonomy to enable organisational learning.

9.3 Features of task and process relevant to training

9.3.1 Project versus process approaches to training

The interesting distinction between instrumental and developmental knowledge types referenced within the thesis arises when one considers organisational change as an ongoing process of survival and adaptation. This view of organisational process is in contrast to one of 'end state' or the project focused planning of tasks. Organisations characterised by a process approach to the development of their operations are more

likely to invest in developmental knowledge and show greater awareness of their knowledge requirements throughout the organisation. Those that focus primarily on instrumental knowledge are more likely to experience difficulties in evolving change processes. Examples of an organisation's focus on instrumental knowledge can be seen in Chapter 6 where the requirement for high level instrumental knowledge required a translation of implicit know-how into explicit learning requirements. In the case of the CLA these learning requirements were dependant upon high level skill even before training was provided.

'[The] essential ingredients [of the investigators job being] to examine complaints, analyse documents, carry out interviews, write reports and to make recommendations. Considerable skills are required in explaining to a complainant why the Local Government Ombudsman was not able to investigate a complaint.' (The Local Government Ombudsman, 1993/94:5)

9.3.2 Level of instrumental knowledge

The knowledge requirements for both the organisations in Chapters 6 and 7 demand high levels of instrumental knowledge. These organisations are referred to within the thesis as 'knowledge based organisations' by their requirements for this type of knowledge within their normal routines. Such organisations are increasingly common and have a familiar set of managerial problems. They are characterised by skill or knowledge levels that imply a greater level of autonomy in individual employees than in many low instrumental knowledge organisations.

These organisations experience difficulties in developing knowledge expertise in staff to meet their operational requirements, with further difficulties in maintaining this due to the high cost of knowledge development and autonomy of the individuals. The tendency is also for their staff to have greater mobility and personal career motivations. In addition the similarities between high level instrumental knowledge and developmental knowledge creates opportunities for these staff elsewhere in other employment.

9.4 Contributions to theory and method

This chapter has focused so far on the output of the research activities themselves and on a number of useful distinctions that need to be made if the limitations and problems of aspects of conventional training are to be understood. Making such distinctions make a contribution to the development of a taxonomy of training issues and knowledge and it is helpful to summarise them as follows:

- Instrumental versus developmental knowledge
- Technological as opposed to technical knowledge
- Knowledge use in contrast to usefulness
- Knowledge exploitation as a progression from assimilation
- Adaptivity as well as flexibility
- Cognition versus structure - individual and organisational assimilation
- Relevance or acceptance of knowledge by the individual and organisation
- Project versus process approaches
- Transition management or evolutionary change

9.4.1 Research theory and method

This final sections reflect upon the research design and the usefulness of combining models of training with process models of cumulative knowledge as an epistemological device for research.

The research design developed from the broad research question:

- Is the failure of conventional training, in meeting organisational needs, due to it being used as a project, task centred 'function' rather than being process centred?

This research issue has been studied using the following sequence of concepts and models and in itself contributes to the development of both research method and insights into the way in which composite models of training and knowledge accumulation may be developed.

In this thesis the role of conventional training has been shown to focus, at best, on the optimisation of existing routine functions and a very simplified representation is shown in the training centric view of learning. On the other hand an examination of cumulative knowledge models of various types suggests the model on the right, Figure 9.2.

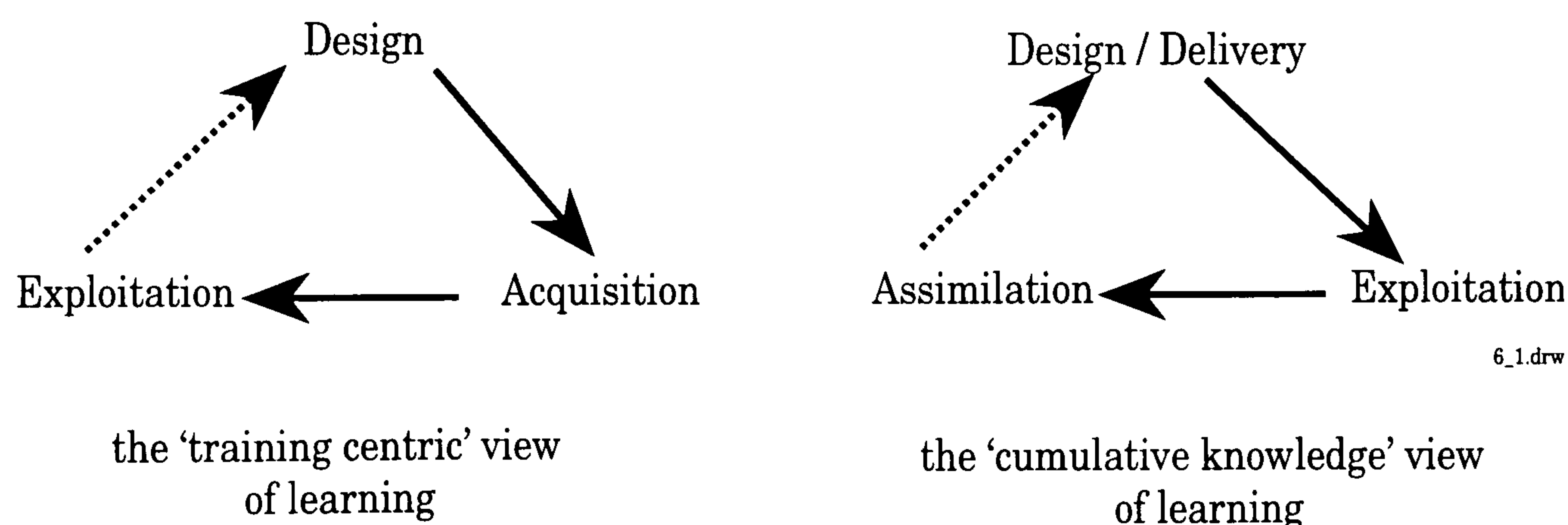


Figure 9.2 Training centric and cumulative knowledge views of learning

What has been done in the thesis is an attempt to explore the development of the composite model by:

1. Clarifying the various dimensions of training and knowledge as summarised in Section 9.2.

- 2. Focusing on the role of exploitation as the potential point of interaction between individual and organisational learning models.
- 3. In particular, using the SFAR model to explore the linkages between the two models, as depicted below.

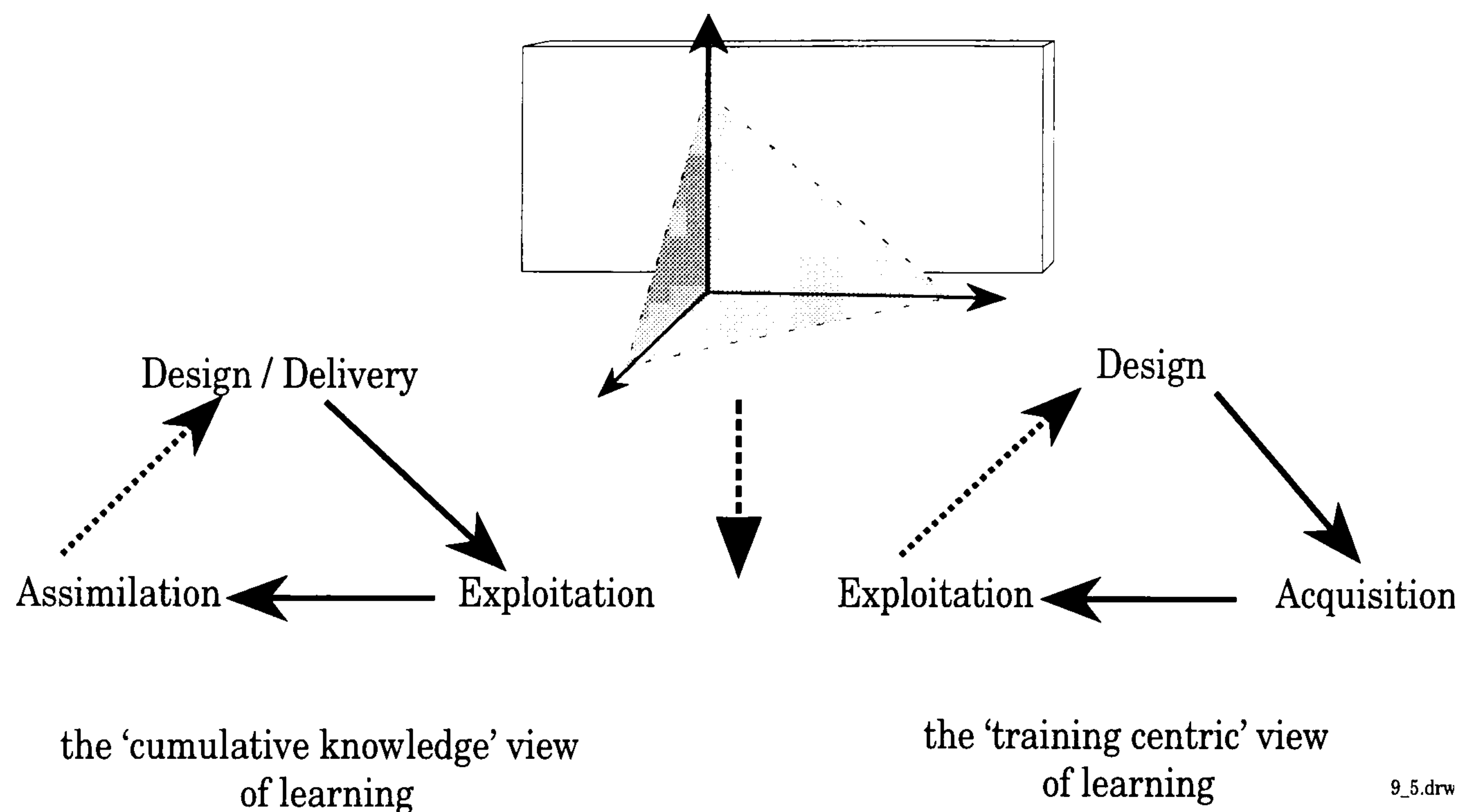


Figure 9.3 Cumulative knowledge and training centric views of learning

In order to identify the appropriate role and domain of each model a composite model will have to be developed as shown below in Figure 9.3, which illustrates the proximity of knowledge exploitation between training and cumulative knowledge models.

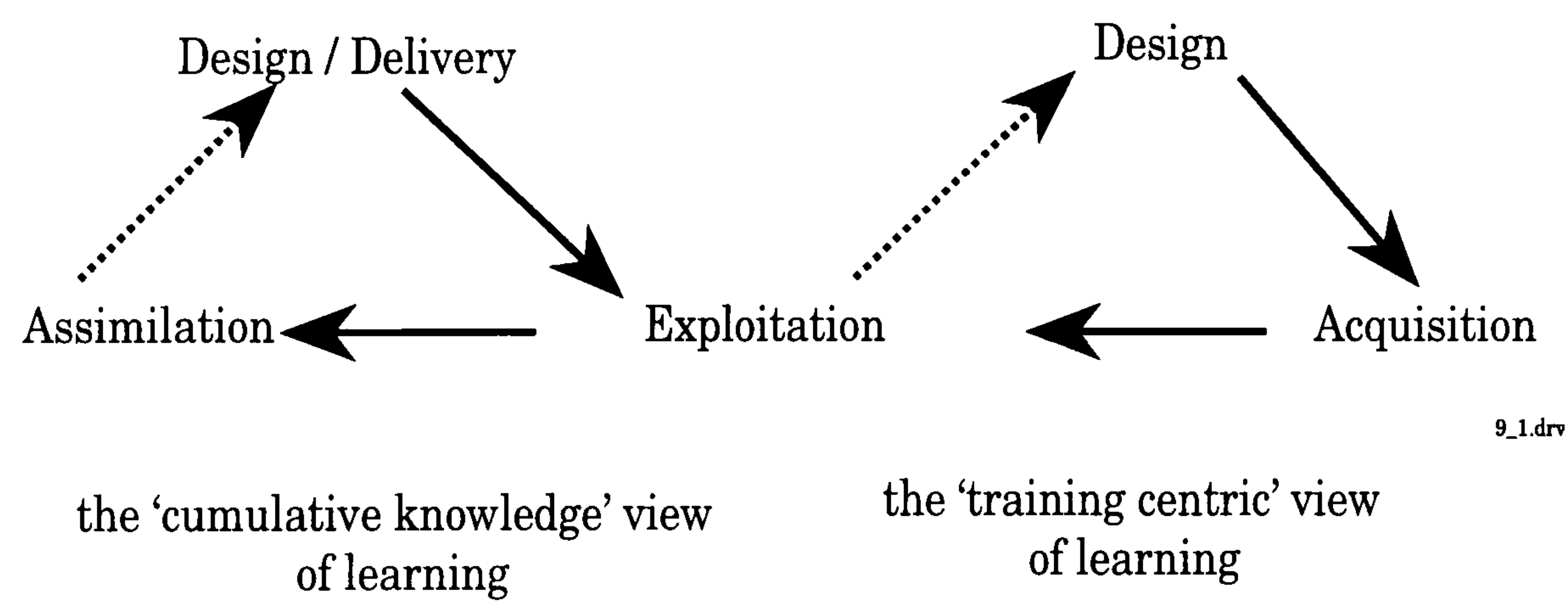


Figure 9.3 Composite model of training and cumulative knowledge

The earlier section, introduced the origins of the question, namely; is the failure of conventional training, in meeting organisational needs, due to it being used as a project, task-centred function rather than being process centred?

By making the distinctions between instrumental and development training it has been possible to distinguish between instrumental training failures that are more commonly characterised by problems of knowledge exploitation alone i.e.structural factors, assimilation and relevance. Where it is unlikely that the training functions will be equipped to specify developmental knowledge requirements and that managerial

autonomy, with the exception of a few organisations, will not be adequate, this knowledge is highly unlikely to be applied.

These distinctions of knowledge type provide a further understanding about the concepts of knowledge accumulation and process models. The research uses the concept of knowledge accumulation from the metaphor of organisational learning - viewing the organisation as a learning process. By using these devices it is possible to identify features of training and knowledge provision which are consistent with a 'process' view, such as assimilation and relevance, which when not present in an organisation, prevent learning benefits being achieved. This in part explains the organisational consistency of cumulative benefits from learning in the firm, or in other words 'how the good go on getting better, and the bad get worse'

The limitations of conventional training functions are not wholly bad and by understanding the appropriate context for training, as an effective knowledge delivery model, certain types of knowledge can be delivered as effectively as other learning models.

One area of this research has been to relate insights from psychology to structured processes of learning provision. Here a training perspective can contribute to organisational learning models. These metaphors have made a significant contribution to the formulation of organisational as well as national policies for technology and innovation when viewing this as a process of knowledge transfer. However, it is only in recent years that the role of the individual within these processes has been recognised in research as a central feature. The shift in focus within technology transfer models which previously had an emphasis on artefacts and infrastructure have moved towards a focus on the role of individuals in activities such as scanning for new and relevant knowledge and the development of knowledge networks.

Research into training offers a similar distinction with cumulative knowledge models of the organisation. The significance of the individual within these models has largely been overlooked. A particular emphasis needs to be placed upon the internal organisational intermediaries in this process - the line managers.

By recognising the vital role line-managers play in identifying knowledge needs: providing accurate operations of need, enabling exploitation and maintaining the dynamic record of cumulative knowledge; the training perspective provides a relevant contribution to understanding this role.

The understanding of the line managerial roles in technology transfer is limited within this thesis. During the research activity no studies were made of line-managers and their role in the innovation or knowledge transfer process. The paper by Seaton & Cordey-Hayes (1993) recognises this role within research but does not address it as a specific issue of individual autonomy.

Managerial roles in the innovation process is both a theoretical limitation within this work as well as an opportunity for further targeted research. By recognising that organisations are able to empower line-managers through greater autonomy it is relevant to consider them as potentially supportive towards actions using

developmental knowledge. Had this research considered training as a significant element within the process of innovation then it would have been possible to structure the research design to consider this issue in more detail. Whilst such an approach would have been possible in practical terms it would have been difficult, as this research shows, to identify organisational examples where evidence could be collated.

Reflecting on the wider characteristics of training failure the research has shows the integrated nature of organisational functions and structures upon managerial autonomy. The discretion of line-managers to make decisions that influence the exploitation of both instrumental as well as developmental knowledge are clearly a function of the context within which that manager operates.

Research which attempts to show that there are direct variance relationships between company size, hierarchical structure, or similar features and training investment or the training outcomes (in terms of knowledge retention) do not address the fundamental issues of knowledge need and the creation of opportunities for knowledge exploitation.

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Appendix A

Technology Based Training: 'Agenda for successful TBT'

Longhurst, P. (1993) 'Agenda for successful TBT', *Training Officer* Vol.29 No.9, pp.279-281;

Success and failure

When Technology Based Training (TBT) emerged in the early eighties as a generic term defining a new breed of educational technology the promises were impressive. Massive numbers of staff receiving stimulating training at low cost was just one of these claims, not to mention the promises of replacing the trainer in the work-place with a product developed from either the Computer disc, Laser-disc, Compact disc (and its derivatives) or Expert System computer technology. The promises of ever reducing media costs as well as development packages to improve the 'in-house' production of media training have all focused the process of training development towards the system purchasers, namely Senior training staff or Senior management and Directors. So, a decade further on, what has changed ?

Research in the Innovation & Technology Assessment Unit at the Cranfield Institute of Technology reveals that there is little evidence to show that TBT has revolutionised work-place learning as predicted. Certainly the numbers of trainers employed by firms to deliver training courses has been reduced, but this cannot be claimed to be the result of 'media impact'. More companies are now using TBT to support their training work, but it cannot be said that media systems have increased the proportion of companies offering structured learning provision for staff. Likewise the increasing competition between training media consultants hasn't been as a result of the technological promise of in-house development . Our studies have shown that there are companies with early laser-disc technology that is still being used to great benefit whilst the dust settles on up to date but unused, technological innovations in other firms. So what, if anything, can be stated that represents the effects of TBT in organisations.

What can be said is that those who were 'doing it well' before the advent of TBT have taken to the new technologies well. In general, they are managing the use of learning technologies with considerably greater success than those whose managerial experience and commitment to staff development was previously weak or non-existent. This of course is no surprise to trainers who identify the importance of learning as encompassing more than a purchase of the delivery system. But it is a surprise for companies that had planned to introduce media training 'in from the cold' as a single project. The need for management commitment and involvement in using TBT seems to contradict the very expectations that the system developers promised, such as 'fail-safe' equipment that can operate independently of other staff and improve performance.

It seems that the hope of an independent learning system is a problematic if not naive one.

TBT is a product in some firms but has been understood by others to be an *enabling technology*.

Where TBT works well, it is the result of a clear understanding of the needs of trainees by senior staff, and close links in learning development between senior managers/directors and tutors.

The greatest effect that media introduction has had on many firms is that the large one-off investment in TBT generates much greater managerial interest from outside the training department. The support that is gained during training design and use encourages a more explicit negotiation of learning objectives between managerial staff outside the training function. Therefore a common expectation of the learning outcome is implicit, with interest and commitment to the learning process in the work-place being heightened. When the new technology is used, those staff involved in the introduction of the package are aware of the learning expectations and ready to encourage the trainees with their new found enthusiasm. Training activities have tended to take place closer to the job and from this experience the technology development process has helped to shape the environment. As a result firms have experienced the successful transfer of training to the work-place.

The traditional experience of training design was usually that of a limited dialogue between the trainer and trainee. Now the trainer, and senior managers demand an agreement on the learning outcomes between staff at all levels of the firm, and this seems to ensure success. Therefore technology that originally appeared favourable for its independence from individuals, managers, and trainers has turned out to generate a dependence on all for success. Most noticeably, the role of the trainer had not been diminished as predicted, but is becoming even more important.

The value of another point of view

The trainer's role as one of the most 'organisationally mobile' staff in the firm has been tested to the full with TBT. For some the 'T' in TBT has been the focal point for purchase and promotion of Technology. But successful trainers have been focusing on the 'B', the Base, and have examined the learning needs of the organisation and have asked how learning can integrate and contribute to company operations in both the long and short term. Technology Based Training represents a strategic option for the delivery of learning by advanced educational media. Yet, the real training needs are all too frequently neglected or only examined superficially.

The different approaches to TBT in companies are a useful indicator of the approach by which a firm might assess other technologies. If there were an industrial 'litmus test' for the comprehensive evaluation of technology we would have a measure of the commitment to examine technology from several different viewpoints or perspectives. Certainly, companies experiencing success with TBT recognise its contribution in more

than financial or efficiency measures alone, but why should perspectives make a difference?

Figure A.1 shows the viewpoint of technology assessment in the firm from behaviour that could be characterised as the 'Technical perspective'. This view uses technical assessment methods to evaluate the costs, benefits and efficiencies that are forecast from a technical change. It is likely to include reference to trainee numbers, the forecasted financial benefits from enhanced delivery resources and an account of the savings made from using other alternative training delivery methods. It also refers to the current technology market and future developments, particularly relating to equipment updating and compatibility.

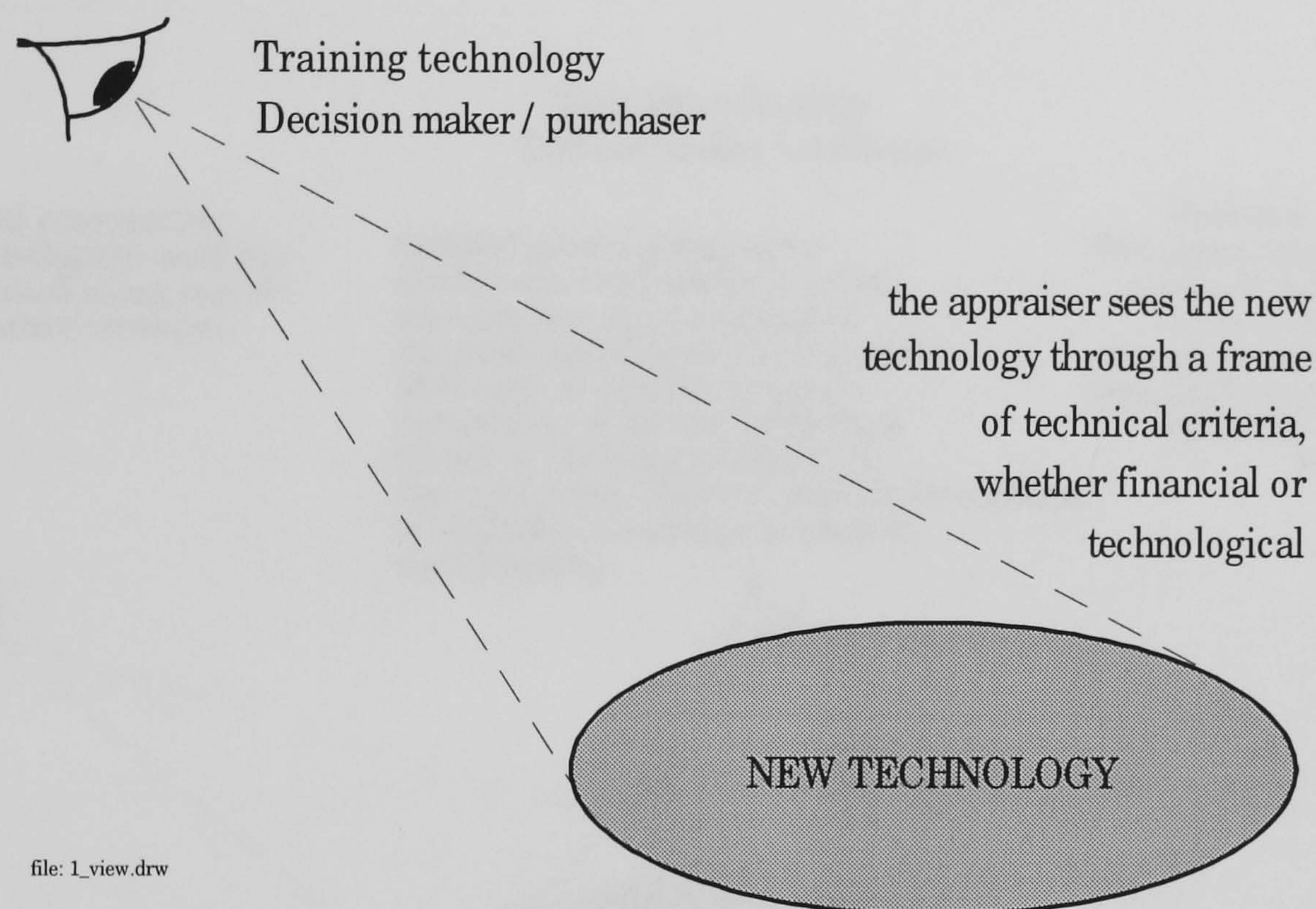


Figure A.1 The technical perspective

Such an approach to evaluating a technology opportunity is very relevant, yet from this view point it is not possible to consider the effect that using the new product will have on the trainee in the work-place or on the organisation within which they work. Nor is it easy to see the effects that the organisation itself may have on the use of the product. Most importantly it doesn't look at the type of changes necessary to overcome the obstacles for a transfer of learning¹ from the unpractised trainee in front of the machine to the skilled practitioner in-situ. The qualities of a more comprehensive technology assessment in the firm can be seen more easily by using multiple viewpoints or perspectives.

For many companies the technical perspective is their only vision. To these firms the organisation is a hierarchy or working system which is governed by a fixed management perception. In these firms the purchase and placement of TBT is not concerned with

¹The term "training transfer" is used here to describe the successful use of work related learning in the work-place.

integration and development but with the delivery of training resources where training needs are identified.

Concern for training delivery is certainly not a bad thing, but where such a 'logistical' approach to learning ignores the differing needs of trainees (including a supportive environment to which the individual is to return to), there is a risk of training becoming a Corporate gesture instead of a strategic use of resources. For example, the reliance on indirect feedback such as end of course evaluations or the use of a limited needs analysis in order to evaluate training need has for many firms proved problematic and often too great a gamble to update the existing investment in training. Whereas those firms that have experienced successful implementation of TBT have taken a broader view of the role of training .

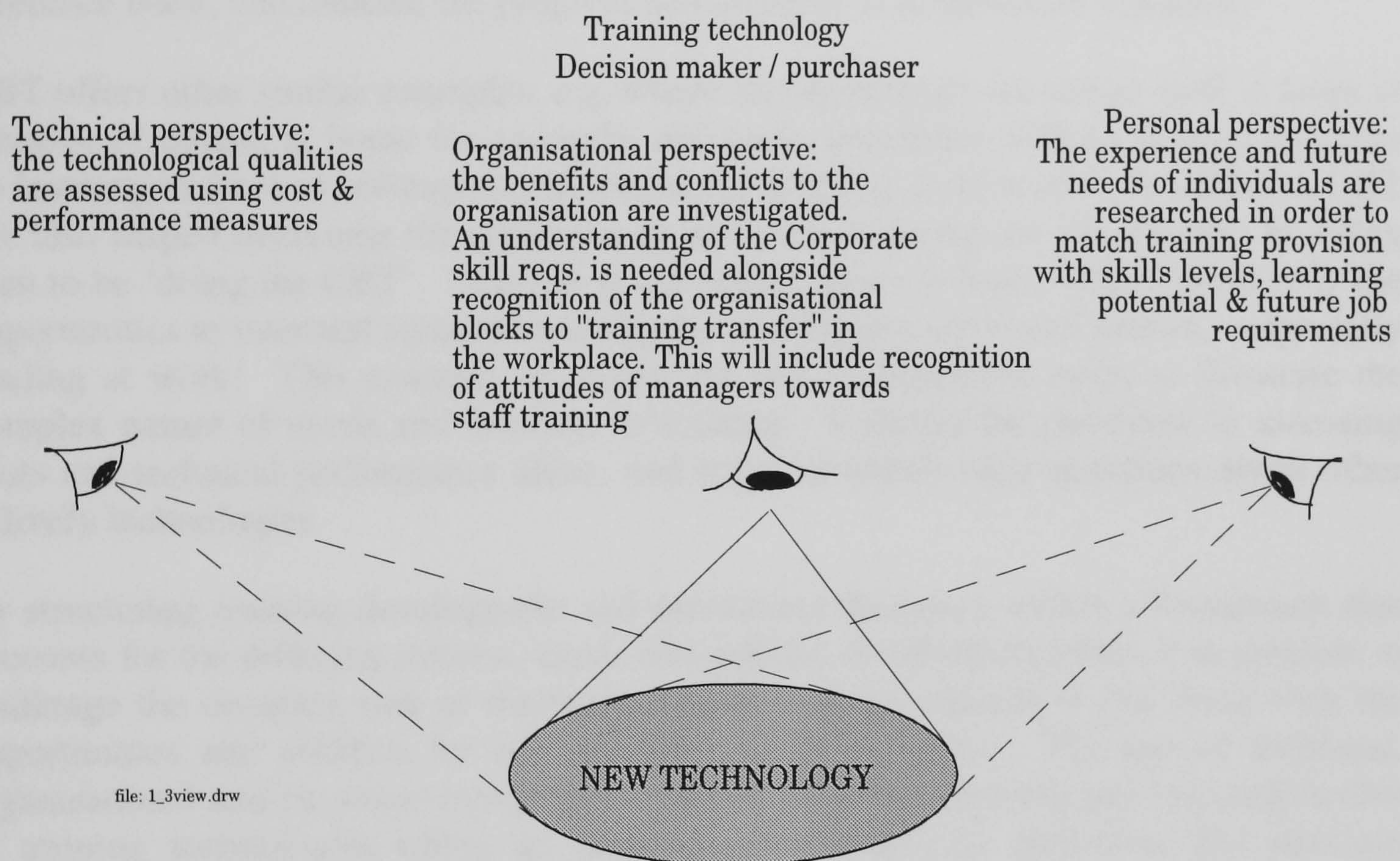


Figure A.2 The multiple perspective

A common example of approaching a problem from a fixed view is that solutions from technical innovations often result in overlooking other alternatives or consequences with results that are at best detrimental to the technical implementation and at worst destructive to training in the organisation. From wider experiences of assessing major technological innovations, research has found that by using a 'multiple perspectives' (Linstone, 1981) approach there is a greater opportunity to formally consider the implications and effects on other parts of the organisation and the individuals within it. This allows a better understanding of the way in which technology works in its 'position' rather than as a 'proposition'.

Figure A.2 shows the effect of including the role of the organisation and individual in this assessment. An example of this analysis can be seen in the advantages speculated from Computer Based Training (CBT). Here, some of the advantages that are gained from using this system contradict the early qualities that were seen as most salient.

early expectations — vs. — later experience	
trainee independence _____	manager/trainee guidance
standardisation ____	company/departmental bespoke
simulation _____	representation
computer led _____	trainee driven

Trainee independence from the work-place is now more commonly seen as less of an advantage than linking CBT to continuing manager/trainer guidance; the attempts to standardise training materials has been overtaken by the moves to use bespoke authoring packages for CBT; accurate simulation of work-place experience or equipment has been less important than the accurate representation of procedures; and perhaps most significantly the emphasis on programmed learning has been overtaken by system designs which allow users to locate their progress, advance & return as if using a reference book, and indicate the progress and quantity of information available.

CBT offers other similar examples, e.g. where the opportunity for senior staff to learn in advance of others, at home for example, and gain confidence without fearing mistakes by learning in front of colleagues can encourage learning at all levels. In addition, CBT has also helped overcome the problems of interruption during on-site training by being seen to be 'doing the CBT'. This has given people space to learn, where previously the opportunities to interrupt someone training by reading text were well known... especially reading at work! This example of media use and development helps to illustrate the complex nature of needs and interests in training. It shows the problems in assessing costs and technical performance alone, and must inevitably raise questions about other delivery technologies

By structuring training development and investment decisions within a framework that accounts for the differing interest, needs and politics of affected parties, it is possible to challenge the complex task of resolving Corporate requirements at one level with the opportunities and abilities for relevant learning at the other. The use of technical, organisational and personal viewpoints to understand the selection and implementation of training technologies offers an approach with which to formalise this decision making. An expectation that will increasingly be required from training managers as the financial stakes are raised in training investment.

Companies have invested considerable finances and energy in searching for a solution to the problem of staff training, and often this has been without recognition of the pressures on training need creation. Solutions of an ad-hoc nature have then been placed in front of trainees, with an emphasis on course completion as opposed to relating the course content to the task.

At a time when governmental support for learning technology is waning (Fisher, 1992), companies are likely to find independent reporting of speculative technology developments less available. The resulting increased risk of mis-information demands a more structured rationale for technology selection implementation and management.

This situation changes the demands on trainers as their presentational responsibilities are reduced and course management demands increased. An understanding of the technology is needed, a knowledge of the firm's needs are essential and a focus on the

role of individuals is critical. As key informants to the training agenda, trainers must acknowledge the different perspectives of those involved in learning provision in order to sell the strategic advantages of learning.

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Appendix B

Five organisations were first visited, a large financial services company, a privatised energy utility, administrative training for a health care region, a telemarketing company and an engineering company specialising in the manufacture of large scale energy generation components. Of these, three were using interactive forms of technology based training. These companies represented differing types of organisation and industry.

The organisations were contacted using two approaches by the researcher. An advertisement placed in the Training Officer journal for groups to discuss technology based training issues with the researcher resulted in responses from two companies, the telemarketing and the health service group. Three of the companies were contacted indirectly through existing research contacts resulting from the CEST work. A number of the firms were concerned about confidentiality and this was assured to all those concerned.

Training in telemarketing

Contact with this firm originated from the Training Officer journal. At the time of the visit, the company had operated for approximately 2½ years as one of the top five agencies in the country. The Managing Director had structured the firm to provide all the services of a marketing organisation under one roof, from customer requests for information, to information provision and direct telephone sales, day and night 365 days per year. At the time of the visit the company currently operated over 80 client accounts and had expanded to employ over 110 operators for their telephone exchange. The company responds to either incoming calls for product information, or it can use existing information from their client's customers to pursue sales or discover customer requirements, excluding 'cold calling'. Incoming calls are received by operator's presented with an on-line script for their response. The electronic script ensures that the operator has appropriate information, replies are fed into the company database.

Training has a central function within the organisation. It ensures that operators accurately present the client's product campaign, that all the information required is collected, and also that the external role of training clients is undertaken when needed. Two managers staff the department with 6 part and full time, graduates working throughout the 24 hr. shift system. On average, 5 to 10 new 'campaigns' are included in training during the day.

Trainees receive a 1-2 week induction course as a group to prepare them for campaign training, telephone presentation, etc. A background to the company, understanding of how the company and campaign accounts work is also given. 'Continuation' training is provided for all staff to ensure a consistent standard of presentation and maintain the operator's interest. Training for campaign launches form the majority of training. Accurate information is important though the script for each campaign is always available. Before use each script is provided to the; Managing Director, Operations and

Supervisors, Campaign Manager, and the Account Director. All training on new courses plans to reinforce the previous training. 'Test calling' of operators is used to identify staff experiencing difficulty, with further counselling provided to overcome problems. The majority of the operators have few educational qualifications, they are good communicators and the trainers found them to be good learners given encouragement, confidence, and sense of achievement when working.

The future intention of the department is to use a CBT authoring package to programme training instructions that would include a graphic presentation of client products. The training budget is determined by the department itself. The main concern being that as long as the department can justify the use of its resources, this is acceptable. The department reports on each client's campaign training costs, and had experienced no difficulties in gaining the resources where needed. The Managing Director works closely with the department, and takes an active role in encouraging new staff and campaign launches to be as interesting as possible. His direct contact supports the position of training in the company as an effective means of maintaining control on behalf of their clients.

The training department was introduced after the company started and thus the choice of on-line media hardware is restricted to the networked system of black and white VDUs. The department's need is to mimic campaigns as close as possible, yet provide as much variety in their training as possible. There was likely to be no change in hardware within the foreseeable future. Free-standing CBT systems were unlikely to offer close simulation with existing office technology, and the perceived advantages of Interactive Technology such as IV did not out-weigh the disadvantages of its costly and slow authoring process. In such a rapid training environment including test calling, role play and counselling in small groups, the advantages of IV offering limited interpersonal skills were already outpaced by existing training.

The company is required to quickly respond to client's needs. Therefore the preparation and development of training was felt by the trainers to be more reactive than proactive. However, by observing the established procedures for developing campaigns of varying complexity, the training department was, in all but a few cases working to predict and be prepared for change, as opposed to reactively finding solutions to the company's needs. The continued expansion of the firm implied an increased need for training services in the long term. Many of the operational systems to accommodate such rapid change existed, with a question only arising as to whether or not 'exit' interviewing could highlight staffing problems that they were not aware of. Staff turnover at the time was not seen to be significant, however, as 'exit' interviews had not been implemented the reasons why staff left was unknown. In such a repetitive, high stress job, it was felt that the approx. 15% annual staff turnover was inevitable.

Training for health service administration

This training department visited was within a main hospital for health care in the South East region of the UK. Contact was made with the training manager via the Training Officer journal. At the time of meeting, significant changes were occurring to the

structure of the health service which consequently resulted in changes to the training provision in the region. At this time there were 2 trainers developing packages for the regional area. The hospital site where they were based employed approximately 50 administrative staff, though the region that they were operating in employed over 500 administrative staff. A programme of implementation and management of IT through training had recently commenced and as a result of changes in funding there now existed mechanisms by which to distribute the cost centrally through the National Health Service Training Agency (NHSTA). The prominent theme in training across the Health Service was that of 'Patient Care'. A health service wide programme had just commenced reviewing patient care procedures and relating these to training provision at all levels in the health service. The major training needs recognised by the manager was that of IT awareness, how to use computers, how to keep internal file systems orderly and how to back-up files. The trainers recognised that these procedures were evidently not happening. To meet these needs an on-site 'trained trainer' was coached from amongst the health service staff so that administrative staff would have routine advice and support from one of their colleagues. These on-site trainers were being coached by one of the central training staff.

The resource services available were largely through the NHSTA. This included a series of videos, packages on IT management and technology and seminars for training managers which included workshops and assessment exercises. In addition to this a local training infrastructure existed which had its own internal resources and were able to pool budget finances to purchase resources and materials for local training provision. The shift in technology resulting in changes in training had increased awareness in the health service regions about the possibility of producing CBT and IV training packages. The complex funding structure within the health service between departments, hospitals, regions and central bodies, all with a capacity to exchange training materials and resource bargain resulted in a series of arrangements being made to support the development of new materials. Further to this, local employment initiatives such as the 'Health PickUp' contributed to innovative training materials or packages that could be applied outside of the health service or outside of its immediate region. This meant the Health PickUp, a government funded employment and training initiative, could also achieve a multiplier effect by the numbers of trainees exposed to their training investment.

Technology issues were of concern to the group as 'Laserdisc' seemed a viable option for the potential numbers concerned. The costs on a regional basis were prohibitive, particularly as leasing could not be arranged for the hardware. Difficulties had also arisen in the past moving hardware between sites, and the technical manager's experience had shown that certain manufacturer's IV laser-discs were susceptible to cold weather and changes in temperature. Attempts were underway to market IV packages within the NHSTA. A further opportunity to develop these packages had been made available by an external company who were able to sell space on a disc to others training producers, thus reducing the production cost of disc pressing. Whilst this reduced the total storage volume of 55,000 frames per disc, few packages used the entire area.

The trainers recognised that the most significant issue that they faced was in involving the supervisory and managerial staff that were alongside trainees in their working day.

They recognised that many trainees felt insecure when untrained in a job and gave examples where trainees experienced stress from working within a group and being less well trained than others. Because of these experiences the involvement of senior managers had become a formal part of the process in establishing training in each of the sites. Specific skills such as It were recognised as causing an increased stress on staff established with traditional office equipment. Therefore staff were encouraged to take training on a prioritised basis of need, identified by line managers, thereby reducing the concerns of those staff experiencing greatest difficulty with the new technology. It was clear to the trainers that 'training access' was the key to overcoming difficulties in the workplace. In this case training access referred not only to experienced staff supporting new skills, but transferring these skills to local staff as work-place trainers and also providing support such as help-lines and technical advice. The It system had established a help unit to offer introductory guidance for recent trainees. Training staff found it difficult to get trainees to use locally based help facilities on IT equipment. The formulation of training budgets was carried out in negotiation with the NHSTA with each 3 year project of approximately £30,000 based on prioritised essential training needs. A project team developed reports for the NHSTA as a contract during the IT and NHS evaluation process. This example shows the resource trading between the central and regional resource basis. The issues raised were concluded by categorising into 5 broad areas of concern: financial, technology, management, organisational, and training delivery.

Energy utility - training by distance learning

Contact with this organisation was arranged through the earlier work with CEST. The manager who contributed to the study was responsible for the group that developed distance learning resources made available to the whole organisation. At the time in which the interviews took place, the organisation employed over 60,000 staff across the UK in a number of main regions. The manager was responsible for the development of training packages in a variety of media types and combinations including text based, audio, video, CBT and IV. The resource centre had its own studio and production equipment and employed designers, administrative and production staff in performing the analysis, design, validation and production of multi-media materials. Figure B.1 illustrates the reporting structure operating within the group.

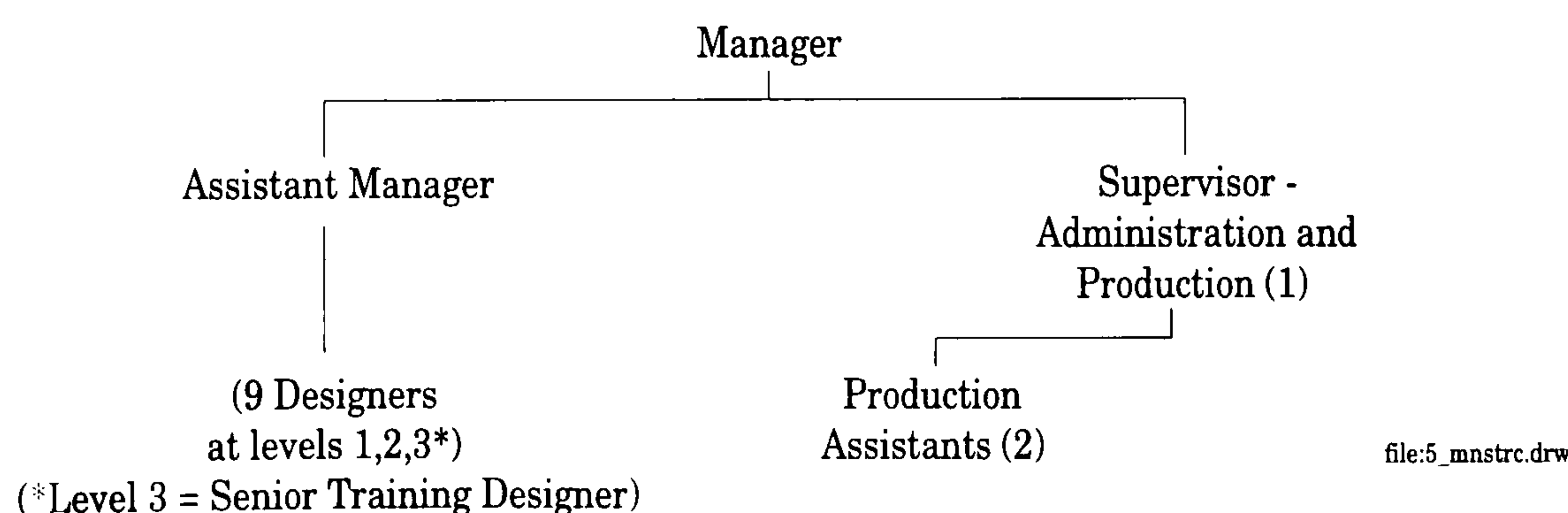


Figure B.1 Internal reporting structure of group

The job function of the training designers represented the central function of the group, with the manager and administrative staff supporting and ensuring that timetables for production were met.

The manager outlined a series of 'core competencies' that were defined by the manager and personnel to ensure that training designers could complete their work.. The statement of these competencies offers a useful indication to the breadth of the training designer's role.

Define the target population of learners.
Specify the requirements for a new programme for a defined target population.
Demonstrate that open learning is an appropriate vehicle for
 acquiring the specified elements of competence.
Develop learning objectives for each programme element.
Specify the content and study requirements of the package.
Select appropriate learning media.
Specify the guidance and support needed from all personnel concerned with each
 phase of the delivery.
Produce an assessment strategy for an open learning programme.
Prepare a production plan.
Brief technical production staff on design lay-out requirements.
Pilot the draft package to confirm that original requirements are met
 amending as necessary.
Prepare final draft ready for production.

(performance criteria set out in the designer's Job description)

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Figure B.2 Responsibilities of the Training Designer

The commissioning of new packages was determined at the level of the group manager. An advisory panel had been set up to guide the group producing distance learning materials with an intention to maximise co-operation between regional training departments and the production group. It was recognised, and stated in the training designer's job description, that special difficulties occurred in the execution of their responsibilities. In addition to the requirement to work effectively as part of a team, it was stated that, "Producing a distance learning package that is 'company wide' in its application but where Regional commitment to it has to be 'won'".

Major elements of the training system

The structure of questioning focused on technology choice and benefits using particular product combinations are therefore discussed with the summary of results focusing on a failures analysis. The matrix below shows a comparison of the training systems for each case. Discussions with managers were used to complete the system definition and these definitions or diagrams are then compared to the specified objectives from each manager.

Organisation \	Financial	Energy	Health	Tele-	Energy
Major Elements	Services	Utility	Service.	marketing	Engng.
			Admin.		
PEOPLE					
Trainees	}}	}}	}}	}}	}}
Instructors	}}	}}	}}	}}	}}
Course developers	}}	}}	}}	}}	}}
Instructional administrators	}}	}}	}	}	}}
Logistics managers	}}	}}	}	}	}}
Subject matter experts	}}	}}	}}	}}	}}
Training aid design engineers	}}	}}	}	}	}
On-the-job supervisors	}}	}}	}	}}	}}
Training system researchers	}}	}}	}	}	}
MATERIALS					
Training aids	}}	}}	}	}}	}}
Training requirements documents	}}	}}	}	}	}}
Training evaluation instruments	}	}}	}	}	}}
Training development aids	}}	}}	}	}}	}
TECHNIQUES					
Instructional design approaches	}}	}}	}	}}	}}
Instructional techniques	}}	}}	}	}	}}
Training development methods	}}	}}	}	}	}
Training aids design methods	}}	}}	}	}}	}
Training needs analysis techniques	}}	}}	}	}	}
Training effectiveness analysis method	}	}	}	}	}
Logistics analysis methods	}}	}}	}	}	}
Key:	}	= no evidence of position / resource / or procedure			(adapted from Hays, 1992)
	}}	= routine (comprehensive) position / resource / or procedure			
	}	= non-routine (or occasional) position / resource / or procedure			

Figure B.3 Major elements of a training system

The Figure B.3 illustrates the differences between training provision and resourcing in the training function for each organisation. The characteristic features of each organisation can commonly be referred to as a training development cycle, as distinct from the 'training cycle' referred to in the thesis. The four key components of this cycle; training needs analysis, program development, implementation, and evaluation, can be further divided into their own subsystems that reflect the structures and procedures of each of these organisation. This reflects the structural differences between these organisations.

It is important to make the distinction between the term procedures that are part of the organisational structures within the training system, and processes which are the identifiable functions of the system itself. This can be more easily understood by referring to the Figure B.3 and comparing the functional categories, or structural elements, and the differences between them. For example, the procedures in training aids may differ considerably but they can be functionally categorised by their process as delivery materials or resources for training. Similarly the individual factors represented for training as techniques of learning, instructional techniques and training development methods etc. are categorised as a subsystem of the implementation programme of instruction. The systemic characteristics of training can be seen when referring to this figure which illustrate the similarities between these five organisations despite their differences in size and function. Whilst all have their own unique training procedures the use of procedural steps to comparatively analyse training between companies would not be a useful approach to understand knowledge acquisition.

Relationships and failures

Training in the telemarketing company was dominated by the need to frequently update campaign information. The rapid updating of information was essential for the company's performance on behalf of their clients, thus the company communication focused significantly towards the trainers, and in turn the trainers met trainees each day.

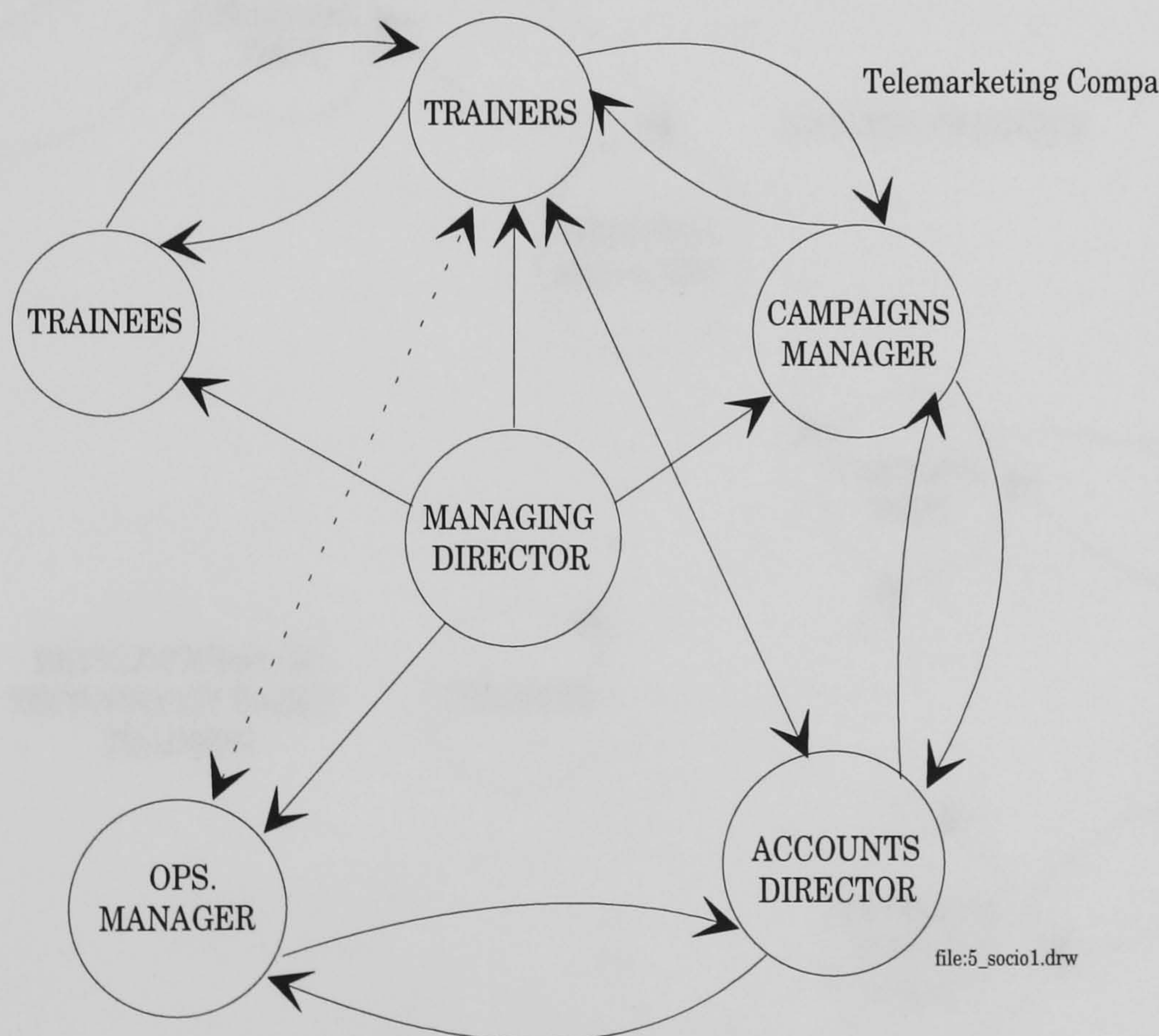


Figure B.4 Relationship diagram - Telemarketing training

The nature of the training was one of information provision rather than interpretation of new knowledge structures. Of particular interest in this company is the role of the Managing director and his close involvement with the trainers and trainees. It can be seen from the diagram from the figure that has a relationship directly with more people

than any other. In this example the trainers were connected to more functional groups than any other within the firm. What is not shown on the diagram is the additional role that trainers have in providing external training for their clients. This brought the trainers in close contact with the beneficiaries of training. Structural adaptations in the immediate production process are shown with by a dotted line denoting the relationship between trainers and the Operations Manager. This occurs when the issue about which training takes place is likely to effect the organisation of the operational function. The limitation of using this example as a case study was that the choice of interactive training media was determined by the existing operational technologies and consists largely of updating information content required by trainees rather than skills. In practice, this company is quite successful in handling training for business performance given the low level of knowledge content that is required.

Figure B.5 shows two aspects of training delivery that are relevant to this research. The top diagram illustrates the somewhat simple set of relationships that exist for routine training i.e. training that is concerned with office and administrative skills, which do not change very often. The lower diagram illustrates the more complex set of relationships that exist under the conditions when a decision making process was required to evaluate investment in the development of technology based training.

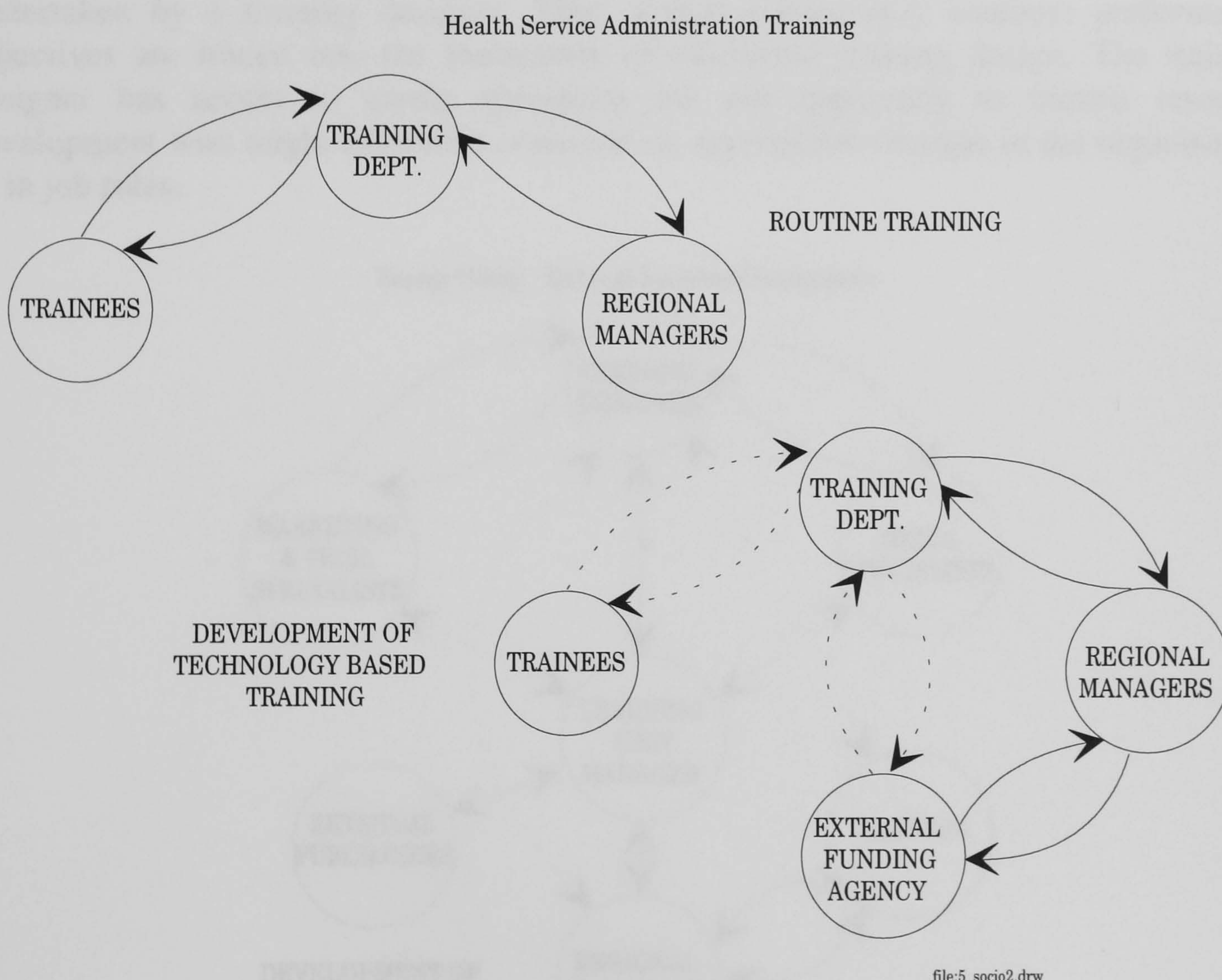


Figure B.5 Relationship diagram - Health Service - Training & media development

In the routine training the relationships between the regional managers and the training department consists of a request to provide training to new staff and those requiring updating on new office technology. The training department's response is one assessing

training need directly with the trainees and arranging appropriate training provision. This routine training is funded by the internal hospital budget and allows services to be provided at a standard cost to the regional manager. This simple set of relationships functions well, but of course does not need to question changes in need and contribution to business performance.

On the other hand, the second figure shows the more complex set of relationships that are required to support the decision making and funding of new training resources. In this case training managers meet with the regional managers and determine a priority of needs for new training initiatives and these are compared against the agenda of interest from external funding agencies, such as NHSTA, TEED, PickUp and external training product buyers e.g. major publishing houses. This resource bargaining process does include a direct relationship with individual training departments, and does not refer at all to individual trainees as it uses the training managers as representatives of the need. At this crucial organisational decision level the issue of organisational structure and ability to exploit knowledge is almost totally excluded.

Figure B.6 shows a more complex set of inter-relationships in which at first sight the learning unit manager is central. However once marketing and technical specialists have raised the possibility of a business need for training, the analysis of that need is undertaken by a training designer. Thus almost immediately business performance objectives are forced into the framework of functional training design. The training designer has access to media specialists but not apparently to human resource development who might otherwise comment on appropriate changes in the organisation or in job roles.

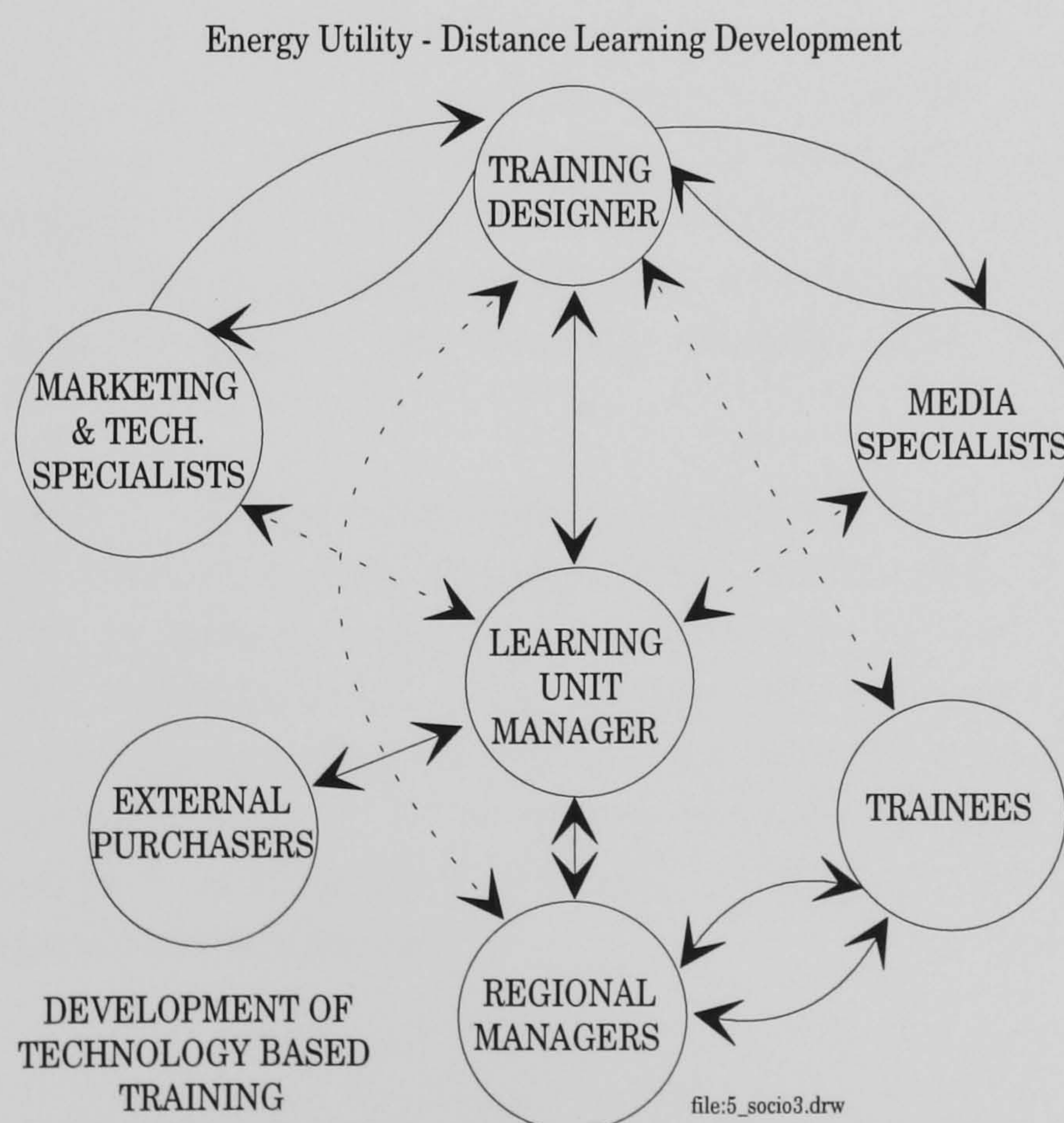


Figure B.6 Relationship diagram - Energy Utility - media development

This whole process is quite divorced from the other set of activities which involves the analysis of the market outside of the company for commercial sales of the training material and the overall demand within the regions for the same material. This role is solely performed by the learning unit manager.

The main issues in evaluation that were revealed in these case studies are:

- level and appropriateness of original training objectives
- organisational level at which evaluation takes place
- appropriateness of evaluation for achievement over time (long and short term goals)
- Unintended consequences of introducing new training
- un-quantifiable payoffs e.g. extended training provision, improved moral etc.

The main conclusion from this research activity reflects the concern about the limited extent to which a focus on the training function both by research and in organisations precludes any significant attempt to connect need for training to the possibility that it will be successfully exploited by the company in pursuit of its business objectives. It seems appropriate that when an organisation relates organisational factors to training need it also needs to consider potential changes in job role as well as the relevance of the training.

Appendix C

Compatibility of training and organisational context

This appendix records the problems that organisations experience when attempting to exploit knowledge where the appropriate context for its use requires organisational adaptation. The requirement for compatibility between organisational context and training provision, in this case, are central to the benefits of learning, even when the training resource is welcomed by both managers and trainees. This study was undertaken by contributing to consultancy research on the ‘receptivity’ of organisations to a training package. The training package offered a method for a ‘holistic approach’ to fault finding (Craig, 1992). This element investigates the factors which prove critical in the take up of such training in organisations. It relates the context of the organisation to the difficulties experienced in the utilisation of training in the firm, and the internal acquisition of this knowledge .

The Researcher was fortunate to gain considerable research opportunity by collaborating with a consultant working on behalf of the Training, Enterprise and Education Directorate (TEED, formerly the Training Agency). The research activity was completed by collaboration and for this reason, uses a number of references from work by (Craig, 1992). The study by Craig focuses on factors that influence the receptivity to fault diagnostic learning when a systems approach is applied. These observations are then placed in context with the problems that organisations experience when faced with training that needs adaptation in their operating context to derive benefit. The research activity unavoidably occurred at a time of significant recession in UK industry and the experience of visiting companies reflected the national economic climate as well as the difficulties that companies normally experience in structuring the assimilation and exploitation of training. However, the principle of this study was to offer a training package previously successful in larger companies and designed to offer a direct ‘pay-back’ from its implementation. The training modules were offered free to each company.

A background to each of the case companies is given and the reception that the training modules received is discussed. The appendix records the experience and findings of each company which is outlined alongside the recognition by each firm of the value of this training and the difficulties that occur in using the ideas from the modules. The findings from the consultancy activity are discussed in terms of the substantive findings reported to the Training Enterprise & Education Directorate. Their significance to this research is demonstrated through the introduction of diagrams of interaction between individuals and organisational structure.

Background and nature of the training

Throughout this research activity the researcher worked in collaboration with a training consultant, who had written a series of modular training units that he had developed from extensive industrial research. The units were designed from studies of the methods used and the performance of ‘troubleshooters’ or fault-finders in industry. The consultant, an occupational psychologist, had identified generic principles by which good troubleshooters achieved fast and consistent results.

The TEED has been involved with research into fault-finding for some time, resulting in a number of publications (Patrick et al, 1986; Craig, 1989) on the development and use of training materials. This work has intended to overcome the assumptions about the nature of this, often considered innate, task. Recommendations to improve industrial practice have also been developed but until this point few training materials were available, and none approaching the problem in such a generic manner, using a systems approach, were available.

Craig (1992:2) recognises that many believe that ‘*you cannot teach fault-finding*’ and offers a series of issues that arise when proposing to develop training for a systems approach to fault-finding. These are summarised:

- The concept of causation is poorly understood by the majority of people working in this field resulting in poor distinction between symptom, sign, fault and cause. This leads to causes being ignored in preference to the more narrow area of fault fixing.
- Past experience of using smell, touch and listening to diagnose faults leads to the belief that the skills of diagnosis are gained by experience and cannot be taught. Experience is now of limited use because of two factors: increased reliability of machines-making the experience of routine faults less common, resulting in diagnostic strategies being necessary.
- As fault-finding skills can be taught, are these skills generalizable across industries? Evidence shows that whilst processes are different the core skills of diagnosis are the same. A difficulty arises here where material from one industry is not accepted in another as being relevant.
- A common practice exists in industry of repeatedly fixing recurring faults. This occurs less where records of faults are kept. This practice is central to the medical profession and a routine practice. However, fault records in industry, where kept, are often poor and inaccurate. No training existed in this important area outside the medical profession until the development of these modules.
- In most cases the boundaries between departments prevent Operators and Technicians gaining an overview of repetitive faults in other areas of the organisation. Senior management are likely to be the only staff able to be aware of this issue, thus cause-related information is restricted to single departments.

- The user or operator is usually excluded from fault diagnosis. Evidence from earlier studies show that even limited information or preliminary diagnosis can significantly reduce diagnosis time and contribute greatly to the performance of the more specialist Troubleshooter. Apart from safety reasons these contribution would greatly assist current practice.

Clearly advances in production technology and automation have increased awareness of the greater dependence on the use of information which:

'...represents what is happening in a system, rather than the opportunity for direct experience. There is a need for the individual to have understanding of the whole system, the part that other personnel have to play in that system and hence communication with them.' (Craig, 1989).

Earlier research (op.cit.) shows the lack of attention paid to the important area of capturing the nature of the fault-finding process in the context of the system(s) that it is being carried out in. This research by Craig not only illustrates the significant differences in performance between troubleshooters but recognises the commonality of approach used by the most effective of these staff in differing industries and professions. A variety of professional and engineering groups have contributed to the investigation of fault-finding principles, including: staff from chemical processing companies, pharmaceuticals, aerospace, electronics, newspaper production, plastics processing, 'white goods manufacturing', chemical fertiliser production and a Professor of Medicine at a Postgraduate Medical School. In recognition that the literature did not offer what could be described as a systems approach, the consultant identified core ideas which were then translated into learning modules and tested in industry for their validity and efficacy.

The collaboration throughout this part of the research activity resulted from sponsorship by TEED who were interested in the feasibility of promoting these training modules across a number of industrial sectors. The objective was to understand the ease with which companies could adapt and adopt the modular units of the course to fit their own operations. The interest in this training development was supported by the Learning Technology Unit (LTU) which was a department within TEED, under the direction of the Department of Employment, formerly the Manpower Services Commission. Three staff from TEED were on the project Steering group; one member from the Learning Technology Unit (LTU2), one from Training & Quality (TQ2), and one from Training Research (TRE5). In addition a member of staff from the British Plastics Training Agency (BPTA) was present. The project Steering group met at intervals during the study to review progress and consider the implications of the study for other firms. The collaboration enabled the researcher to contribute to both TEED's concern to understand the opportunities or difficulties that companies experience in using innovative training material, whilst also contributing to the researcher's own agenda for the thesis. This rare opportunity to contribute to such an innovative development was useful in studying the issue of organisational context.

Five training modules were prepared by the consultant for the fault-finding training:

- **Module 1 Listening and Questioning;**

This module divides into the two above areas to demonstrate the necessity for the accurate collection of information about faults at the earliest stages in diagnosis, as well as the more familiar use of these skills when listening to mechanical equipment. Commonly few people ask adequate questions from the reporters of faults about the nature in which the symptoms developed.

- **Module 2 Strategies;**

This module focuses on the various techniques that are used by people who frequently perform fault finding and diagnostic tasks. Each technique is presented and their appropriate use is explained.

- **Module 3 Systems Thinking;**

Systems thinking is intended to raise the level of awareness about this approach to structuring a problem. It is designed to help a troubleshooter structure order in complexity and thus gain a 'whole picture' of the immediate system. As well as how this system is affected by others.

- **Module 4 Fault Diagnostic Recording;**

The majority of faults have some link with previous failures or failures in similar or neighbouring systems. This module looks at the range of established methods available to record faults and how to keep such a system viable in a busy work environment.

- **Module 5 Costing.**

This module identifies the costs and means of measurement involved specifically in the fault finding process. The cost module addresses the issues of 'downtime' alongside the costs of maintenance and the debate over explicitly identifying cost issues.

An additional Module 6 on 'Managing the Training Function' was prepared but considered less relevant to the issue of fault diagnosis by the client companies. In practice the aim of Module 6 is to introduce the key issues of managing training for fault diagnosis.

Research design

The research activity acknowledges that two agendas of information were present: the substantive issue of evaluation of a training package for the training agency, and the researcher's objective of understanding better organisational barriers to the exploitation of knowledge. This gives rise to two roles for the researcher, firstly as a 'co-interviewer and consultant' with the TEED project and secondly as a 'non-participant observer'. There are two forms of output from this chapter. The first of these concerns the

substantive issues of receptivity to the training package and is discussed in Section 7.6. which contains relevant material from our report to the TEED. The second output consists of findings concerning the issue of appropriate context and knowledge exploitation, and is discussed in Section 7.7.. As will be seen, the interests of the TEED to some extent overlap the interests of the researcher rather more than was the case in Phase I. In addition the researcher was able to extend the questions during interviews to include the broader issues relevant to the context in which other training experiences occurred in each company.

The role of a participant observer is the chief method of ethnography. In practice this tends to be a combination of techniques or style of research. The central idea is:

‘to penetrate the experiences of others within a group or institution.’ (Woods, 1986:33)

In this case it would have been inappropriate to assume a role within the work group in order to experience the difficulties of assimilating and exploiting this training as the researcher was already familiar with the training materials throughout their development and would gain no greater benefit from attempting to understand the training difficulties by joining the work group.

In contrast to this, the role of non-participant observer was more appropriate to this study and it reduced the ethical considerations of temporarily joining a work group under ‘false pretences’. This approach does not overcome all ethical considerations in the research activity and in particular two areas were of concern: visits to industrial organisations to investigate the performance of organisational procedures inevitably arouses discussion from the respondents of concerns or conflicts which may feel not to have been heard by the managers;. whilst, as a ‘guest’ of the managerial staff in the firm it is important not to condone conflict, nor to conceal concerns that have been raised. Clearly the mere presence of a researcher studying elements of individual and organisational performance can be of concern to both staff and managers. In all of these organisations the researcher and consultant benefited from the experience of staff who tackled problems with humour and goodwill, despite the uncertain economic climate and their often significant workloads.

The aim of the evaluation programme was to improve the fault diagnosis training material in small firms. The evaluative structure proposed by the consultant for use in the study was from Stufflebeam (1975), the Context-Input-Process-Product (CIPP) model. Romiszowski (1984) and a number of other writers refer to the application of this model in reference to the process of instructional design evaluation. Its use in these circumstance focuses on improvement, rather than proof, of the training material. The use of the CIPP model is of particular interest here as it identifies ‘context’ as one of the areas of concern when evaluating an instructional system. The four elements are described by Craig (1991)

“Context: *Factors within the context of a company can, and do hinder or block totally training in initiatives no matter how well planned and executed the*

training programme may be. Adverse contextual factors can provide a graveyard for training programmes.

The aim here is to gather from practitioners and managers examples of: situations, company climate, structure and attitudes which they consider provide blocks to training in general; then to this training in particular.

Input *It is the inputs which provide the cost side of training cost/benefit analysis. The aim is to gather, from the practitioners and managers, what training inputs exist at present. For example: lesson plans, training media, time, facilities, aids, etc.. Ask whether costs exist for these inputs. Then specifically identify what inputs they see as necessary to implement this training; How practicable? How realistic? What blocks exist?*

Process *For the person evaluating the training material it is how the actual training delivery can be improved that becomes the key question.*

What monitoring system is in use at present? Then, more specifically; how can this training be monitored and improved as necessary?

A key question here is who can be responsible for acting in a tutor role for the delivery of this material? Also, how much time can be devoted to this task? Another key question is, how will people new to the company learn from this material? The options for this process part of the training delivery are as follows:

A series of taught sessions off the job as time allows, followed by, use the of material, on the job, under tutor guidance,-the method used in the consultancy evaluation project.

A self-directed approach, working through the material alone or with one or two colleagues, again with tutor support.

A formal course delivered by a skilled trainer who is also experienced in troubleshooting, and who is happy teaching to this material.

At this process stage the emphasis is on how well learning is being achieved, and is not concerned with actual results. It is important that the learners have a major input at this stage; in this project they should be aware of being involved in the development of a company fault diagnosis training programme. Their 'results' are not being questioned.

Product *Again it is the user who must direct us towards the criteria which enables us to evaluate the outcome or product.*

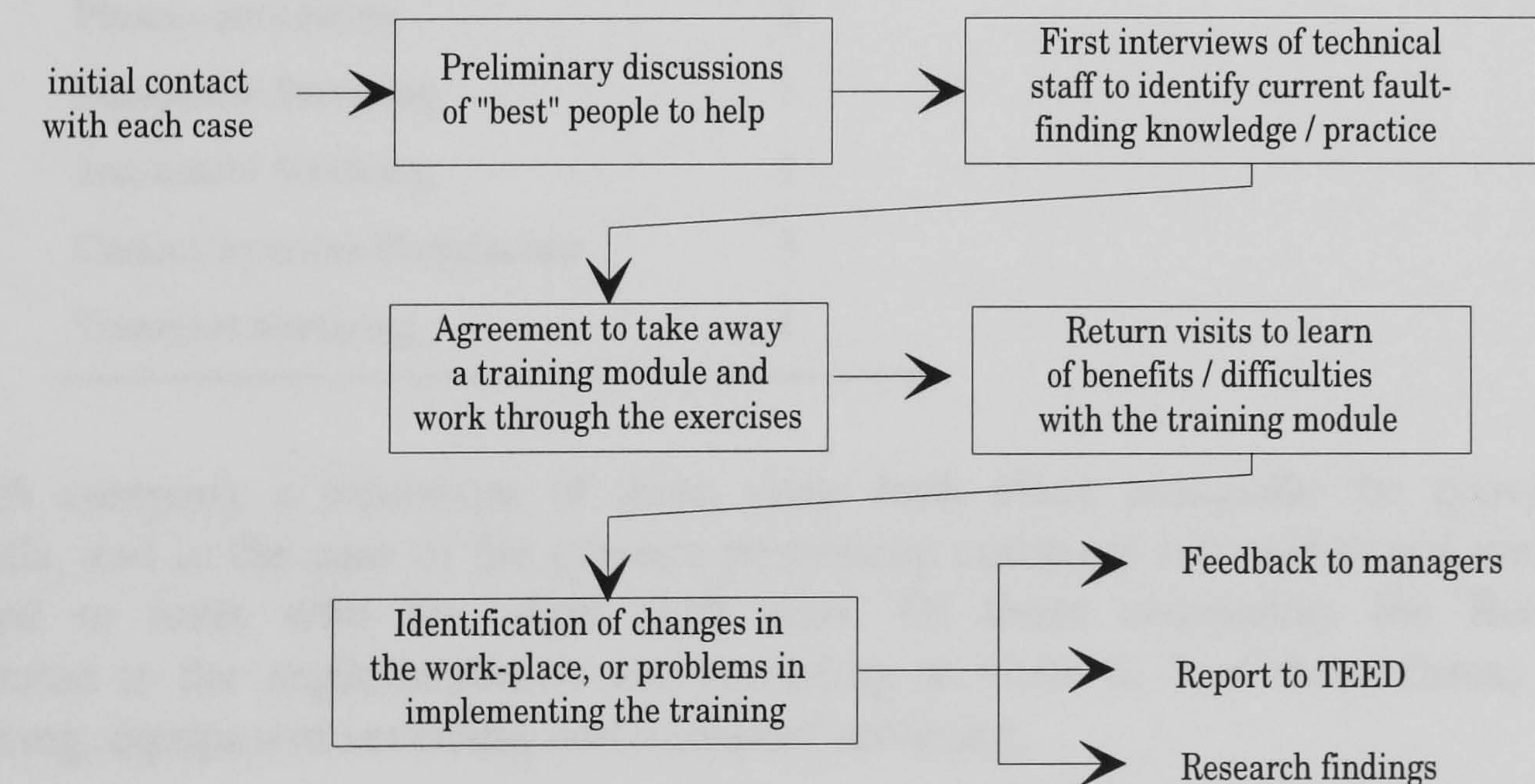
A company that deals in high cost components will see the holding of slack in terms of capital intensive spare parts as an area of potential cost reduction. A training outcome that can influence such savings will be judged on this criterion, and will take priority over say better fault diagnosis techniques.

CIPP offers a useful framework to evaluate the 'moments' (Romiszowski, 1984:214) about which the instructional designer is concerned. This approach from the systems literature can be used in for a wide range of programmes as it offers generic as to how to structure a formal evaluation. Of particular interest here is the reference to 'Context' as being of importance to the learning outcomes.

Romiszowski (ibid.:216) uses three levels of context to distinguish between the proximity to and control of context which is relevant to the instructional designer. The term 'micro level context' refers to the 'climate' that exists in relation to the course and the resources or methods used which surrounds the learner. Micro level 'Level 3' (op. Cit.) in this case is clearly distinguished from those factors that are macro level in nature. Management approaches, social attitudes and organisational structures are referred to as the macro level issues that form Level 1. The next level of concern is that of the availability of support and a 'favourable climate' that exists in relation to the course. Thus the approach used by the consultant is usefully congruent with the overall approach to the research in this thesis.

Consultancy procedure

Figure C.1 shows the overall sequence of the consultancy project for the Training, Enterprise and Education Directorate which is further discussed below. It was agreed that the study should focus on the potential for small firms to either use the modules as they arrived or to adapt them to their own needs.



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Figure C.1 Sequence of case visits

Contacts were made directly to firms from a business directory selecting on a criteria of companies employing between 50 and 200 people. From a larger group of original firms, each company that had replied positively were asked to receive the training modules, free, whilst collaborating as part of the study. Company size was useful here as an indicator to select organisations that were unlikely to employ specialist troubleshooters and more likely to have staff with the role of fault-finding as an integral

part of their job. All of the case study companies were provided with the 5 modules and asked to comment on which areas of study they felt would be of most value to them. In addition one manager was provided with the Module 6 'Managing the Training Function', after requesting this.

The consultancy was concerned that employees should not feel that their own abilities to troubleshoot were at question, neither that effective troubleshooters were 'born and could not be taught'. Attempting to introduce training where these feelings are strong is likely to be difficult.

As each member of staff were provided with copies of the module they were interviewed to give an indication of their interest in each module. From this initial interview the managers responsible for training then reported on the value of each training unit and the extent to which this had contributed to their routine job function. In all of these firms interim visits were made to monitor progress and provide additional manuals.

It was believed that companies which could provide a 'test' of the training value through costed performance indicators i.e. where training pay-back was more obvious, would be of most value. The performance of a troubleshooter has a direct influence on the pay-back time of machinery and thus the profitability of each business. Of the total number of 12 firms participating in the wider study of module development, 8 firms were contacted as part of the 'Small Firms' study for TEED:

Small firms:	No.
Plastics processing	2
Equipment Servicing	1
Instrument Servicing	1
Control Systems Manufacture	3
Transport Servicing	1

At each company a minimum of three visits took place alongside the provision of materials, and in the case of the plastics processing company two additional visits were arranged to meet with the night shift staff. Of these companies the Researcher contributed to the implementation and recording of visits to 3 of these firms; plastics processing, equipment servicing and transport servicing.

A target of at least five practitioners and one manager was specified for each company so as to gain adequate comparisons across the ability range whilst also gaining an understanding of the company context. From the first contacts managers accepting the project were encouraged to nominate staff to take part in the study who were likely to benefit from the modules.

The job functions of the staff interviewed by the Researcher were:

- *Technician;*
- *Fitter (mechanical & electrical);*
- *Engineer;*
- *Field Service Engineer;*
- *Craftsperson;*

The case companies

For each organisation a background to the firm was required and the experience and education of trainees was recorded. Details of the main job function of each member of staff were outlined during the interview along with the extent of fault-finding undertaken throughout the normal working day. The purpose behind the modules was explained and those willing were given copies of the modules that they believed to be of greatest value in their work.

Equipment Servicing Company:

This firm employed approximately 20 field service engineers supplying and maintaining point-of-sale (POS) equipment throughout the UK. The parent company is Japanese and all of the products supplied were imported. The first contact was with the Training Manager who was enthusiastic about the potential benefits from the training. The major clients of this firm are supermarkets and large retail firms, in addition a number of retail and food chains such as pubs and restaurants with single POS items at each outlet. All of these company's clients were dependent on the performance of their POS equipment. At the minimum a fault in this equipment results in pre-programmed price information being lost, at worst, the failure of one or more POS stations. Major failure could result in a retail outlet losing the capacity to accept payments at one or more of its check-outs. In discussion with the field service engineers it was clear that these faults caused concern to the company and their clients, as well as on occasions, considerable personal stress to the field service engineers faced with angry landlords or supermarket managers on arrival at a call-out. This company had clear motivation at all levels within the firm to improve the performance of its troubleshooters and the capability of its fault-finding in general.

The result of using the training packages were very uncertain and there were plans to make technical staff jobs redundant pending the results of tendering for two major contracts. Engineers gave considerable attention to the packages and had come into the Head Office to give feedback on the courses, as they usually worked from home. The reaction to the material was very positive, and the trainer was planning to build parts of the material into a new training programme that will emphasise customer relations. There was universal agreement that the actual techniques of fault diagnosis (Module 2) were of little importance compared to the skills of questioning for faults and of fault analysis. Development of point-of-sale technology is leading increasingly to 'board changing' and general de-skilling of the service engineers' work. The need was

recognised to be for staff to relate to customer needs better and to understand the systems in use as they affect each retail operation. For this reason the most important contribution from the training was seen as being the listening and questioning module along with systems thinking and fault analysis. The planned result of this training was to hold a one or two day course at the headquarters, conducted by the technical advisor, using selected parts of the training material.

A further plan was to include training support in the service offered to customers. The plan was particularly focused on the two new contracts in recognition that such service support could contribute to winning the contract as well as improved information for the field service engineers. There was less optimism for influencing existing customers in this way as the company saw great difficulty in re-educating the customer to consider the nature of the fault and ensure accurate information of the symptoms before calling-out an engineer.

From the interviews with the engineers it became clear that they could not agree on the criteria measures that were appropriate to indicate the value of the training. The Technical Advisor and three Senior Engineers differed greatly in their confidence about measuring training benefits. The question relating to benefits in terms of time are shown here, where:

1=Absolutely confident

2=Confident

3=Doubtful

4=Not confident

Time related question	Respondent	TA	E1	E2	E3
a)	Can improvement in time taken to respon	1	2	1	3
b)	Can improvement in time taken to diagnose a fault be measure	2	2	4	3
c)	Can improvement in downti	2	2	1	4
d)	Can improvement in the time between <i>same faults</i>	2	2	3	2
e)	Can improvement in the time taken	1	2	3	2
f)	Can improvement in the time t	1	3	3	--

Figure C.2 Table of confidence indicators for measuring training benefit

The Transport Servicing Company:

Previous to the study this company was a local authority operated garage. It operates a large fleet of passenger carrying vehicles. These are purchased from a variety of suppliers with differing service and maintenance agreements. Vehicles vary in age from between 1-12 years, with 5 years as average. Traditionally the garage has divided skill areas into electrical, mechanical, and body-work sub-systems with the all vehicle fitters

having completed an apprenticeship in one of these skill areas. However, the division of vehicle repairs has increasingly proved difficult to divide conceptually into these areas. Amongst the fitters some agreement existed in how to sequence work 'cross-boundary' work in the garage, such as the repair of electro-mechanical components. But this tended to be informally arranged between the most established fitters who would either work together on removal or replacement of complex components, or would accept a colleague working on electrical or mechanical areas after they had given guidance. The increasing complexity of vehicle design and construction meant that the majority of vehicles now challenged this practice of functional division in vehicle components.

The benefit to the firm from improved fault-finding was seen by the operations manager to be mainly from a reduction in 'off-road' time for these vehicles. This was a significant cost for the operator. For the fitters the benefit was agreed to be an improvement in the reliability and detail of information received from drivers when leaving vehicles for repair. The previously poor level of information resulted in frustrating searches for the fitters to discover, for example, 'a knocking noise' which might be indicative of a bearing failure or similar critical component, or merely a loose panel or seat.

The Plastics Processing Company:

This company produces thermo-plastic extrusion profiles in a variety of cross-sectional designs for a large number of clients. The common products are translucent covers for fluorescent light fittings and lighting display products. The factory operates a number of batch production processes using manufactured dies by outside engineering companies.

The extrusion method used is extremely slow, with faults in a single unit commonly resulting in 30 minutes of process production time being lost. Predicted faults such as wear in the profile die could be expected, however, a range of faults also occur from the frequent change of nozzles and moulds for different batch jobs. Each change requires trial running to ensure not only the profile accuracy, but the straightness of the overall product. Occasionally unorthodox adjustments are made to the cooling line such as placing compressed air cooling on sections, or introducing curves with pressure strips to offset the unintentional effects of cooling and miss-alignment of these dies. Whilst the quality of the material mix is stable, it was suggested that changes in the temperature and humidity of the factory caused additional variation in the stability of the profile once it left the die to cool. Agreement to introduce the training package was gained with the Senior Works Manager during a meeting at which the Training Officer, Design Engineer and Shift Foreman were all present. And though the Senior Works Manager was not hopeful of any significant results he agreed to support the introduction.

The shift engineer identified key areas of change as a result of the training manual and the use the training material was to the firm. The company was experiencing considerable difficulty within the financial climate, and as a result of a serious decline in demand for its products the staff had recently agreed to a pay cut. This made the reception of new initiatives and working practices less easy. However, a number of changes were evident. A communications notice-board for production and plant

performance information had been introduced on the shop-floor. The success for shift changeover was noticeable and resulted in a similar board being accepted in the office for production and office use. Machinery was now marked with card tags when faulty in order to save time in attempting its use. This practice was to be extended to include fault information. Company plant and machinery fault data is now recorded on a Carddex system to be completed. A routine maintenance schedule had been introduced for all plant alongside the current “on demand, ‘failure’” servicing. Spare parts and stocks were now related to expected failure of components, for example, thermocouples. This prevented both substitute components being used from already ‘set’ machines thus remaining undisturbed. The company had previously depended on its neighbouring sister company and had been discouraged from ordering components in advanced. Production jigs specific to each job, for example, air rings for cooling sections, were now produced with each die to avoid cannibalisation of components. This was in recognition of faults induced by earlier adapted equipment. Thermocouples were now being stored in one place and returned marked ‘faulty’ when damaged. A stock of inspection samples were being produced during ‘start up’ to give examples of finish tolerances. A reserve stock of these were now being held by the shift engineer to allow for the loss of these on the work site.

It was intended that all ‘setting’ information should be entered into the on-line PC system to prevent loss of setting cards etc.. The PC system was available though the data entry had yet to be completed. A styrene filling system had been put on line to reduce the repetitive hopper filling, enabling quality checks by operators to be undertaken.

It was generally true that the majority of changes were as a result of one engineer's awareness of the fault identification systems resulting from this project, and few of initiatives had arisen from staff by the use of training. This engineer had also been made responsible for training, though there was a general belief on the shop-floor that employees expect everyone involved in production to have ‘hands-on’ production experience before they could command any respect. Shift operators had tended to retain information about improvements to the system as this guaranteed their job security-at least temporarily, in positions where others were likely to experience difficulty and then be more likely candidates to be exposed to any redundancies. The challenging of work practices and introducing training which had not previously been in place was proving difficult. And it was seen to have to be done ‘sneakily’ without obvious claims as to the idea being from anyone other than the managers themselves. Therefore the approach had been to encourage recognition of the operators job as a skilful one and emphasise the product finish as being the most critical phase. Charge-hands were pleased the company was questioning ‘what would make the job easier’.

The manual was only offered to the charge-hands of each shift by the company for their views. All felt the training was a good idea. The central criticism was that the terminology, for example the abbreviations were unfamiliar. These abbreviations and associated terms were placed in full at the beginning of the manual, but the difficulties experienced by the shop-floor staff in finding these were evident. It was clear that the readers had not linked the introductory guidance with the text, nor searched for explanations. A written text manual seemed to be inaccessible to most operators & shift workers. Unless it was introduced to them step-by-step, this seemed likely given that

many workers had not formally learned from text for some. The engineers seemed to experience less difficulty here.

Consultancy conclusions

A summary of the report for TEED is outlined here from the internal working report to the project steering group.

The project outlines a number of aims and specific objectives at its outset in order to demonstrate the application and potential for training in this area. In meeting these objectives, the study reinforces a growing understanding of the effect of the current industrial climate that exists for most firms at this time. Some of the operational characteristics of small firms in the UK; namely, severe cash flow problems and lack of awareness or commitment in training their staff are clear. However, the failure to train employees in the SME is evidently for both cultural and financial reasons.

The CIPP model is a useful structure to view the results of this work, and by using this evaluation mechanism the project offers evidence of the difficulties that many firms experience in taking training products and using them in the company.

The interpretation of results using a proactive model in companies assists in understanding the firm's training behaviour before making evaluations of their ability to use the material provided. The provision of bespoke packages to companies proved persuasive to those who recognised that they may have a training need. This did not, however, guarantee that they were able or experienced enough to take advantage of this opportunity.

The issue of companies failing to create a 'learning organisation' or climate in the firm in which the trainee and others are not threatened by learning behaviour (interest, enquiry, testing, error-making, communication) has been evident in a number of the case studies and it is useful to see the examples of individual staff learning at "home & away" from the firm in order to maintain their professional development.

The significance of the effect that a "Systems" approach to training makes in the firm is seen here as a clear challenge not only to the trainee (in learning), but to the whole system of operation (the Firm and all those in it). This is particularly evident in the study when a firm is only likely to benefit fully from the material by co-ordinating a change in the working practices of the System e.g. costing, fault recording, communication etc..

At this point emphasis is placed on the trainer or 'Champion' of the training who is likely to need to defend both the trainee, him or herself, and the value of the training in order to succeed in creating change within the firm. A means of avoiding this (often reducing the transfer of training in the work place) is to

remove the trainee from the work site and establish training more formally. However, in this material the majority of skills are not exclusive to the individual, relying on the acceptance of others to learn and change.

The tutor input in many of the case studies has been seen by the trainee as coming from the researcher or the trainer, with only the study time being allocated by the Director or Senior Manager concerned. Those firms experiencing difficulty in identifying the benefits of training, there is some evidence to indicate that there is a greater distance between the trainee and the manager looking for measurements of this change.

Where the trainee's communication with the "purchaser"(of training) is restricted (either by structure or status), the long term and non-direct cost benefits become harder to identify. In the SME, where time is the most critical input, an acceptance needs to be explicit from not only the trainee, but also from those expecting the benefits, that time is a requirement from the purchaser-sponsoring manager-for the successful transfer of training. Where "great expectations" exist from the Manager this can only place the trainee in an isolated position attempting to justify the input of resources. "A System Approach" to training in the firm therefore appears to require leadership. Managers could be supported to offer an alternative method of Systems approaches to training, as with Quality Circles such as, one issue of development at a time e.g. fault records across the company (this could prove more successful in the firm than a single trainee completing the entire systems course). This can still remain Distance learning, but without "Distant" co-ordination.

The study has shown the approach that SMEs take when interpreting training material for their own use. The evidence demonstrates that considerable difficulty is been experienced in encouraging firms to take a "wider" view of their operations, even though many companies recognise a need to do this.

In conclusion to the project, the study shows both the potential for a systems approach to contribute to company training behaviour as well as subsequently, the firm's operational skills. However, it implicitly shows the problems involved in gaining the momentum to do this in many firms, regardless of the training product.

The modules, other than those of 'System' and 'Costs' have been identified by the companies to be of direct use. The firms' failure to recognise the wider impact of systemic training results in key areas of training material being edited. Whilst this may initially be seen as an organisational issue and not one of training, it remains a training problem when it restricts company learning and the potential to develop.

Research observations arising from the consultancy

The main research observations arising from this consultancy are listed below:

1. Training problems from structural change and environmental effects on the firm, company by company, increasing degree of severity or problem
2. Difficulties in linking an approach to training that is integral to operations
3. Difficulties in communicating the experiences of training across the organisation where no adaptation is planned
4. The closed nature of many training functions
5. The challenges posed by many organisations once the training function is opened
6. The necessity for multi-boundary consultation to address training development issues

Situational factors - structural attributes

Given that the package presented was genuinely considered to be relevant to these three companies, above, and that there was clearly no great difficulty in the relevant employees assimilating the content of the modules, it suggests that the failure of to apply this training lies more in the area of situational factors and in particular problems to do with organisational structure, departmental boundaries and appropriate job specifications.

Such an example occurs where the fault-finding training package is used, and is supported by the managerial staff of the electronics firm. The training resource is provided to field service engineers, who maintain a network of cash register and point-of-sale equipment. Even though the field service engineers are enthusiastic about the training, in the belief that it will enhance their productivity thus increasing their job security, the requirement to pass-on fault information and exchange details of fault records is seen as incompatible with the individually competitive climate between the engineers in the company that has occurred as a result of increasing job uncertainty and redundancies.

The diagram in Figure C.3 illustrates the communication conflicts that exist between the need to share fault information between field service engineers and the centralised nature of the company's operations. By operating a system where the home-based field service engineers only met head office staff when calling for central services, no opportunities existed for the engineers to share information. Further, even if regular meetings were to be held between all technical staff, the competitive climate between engineers discouraged the sharing of fault information. It was evident that for the company to benefit from the full opportunities offered by training, the communication and competition issues needed to be overcome. These issues confirmed the identification of points numbered 2, 5 and 6 in the above research output list.

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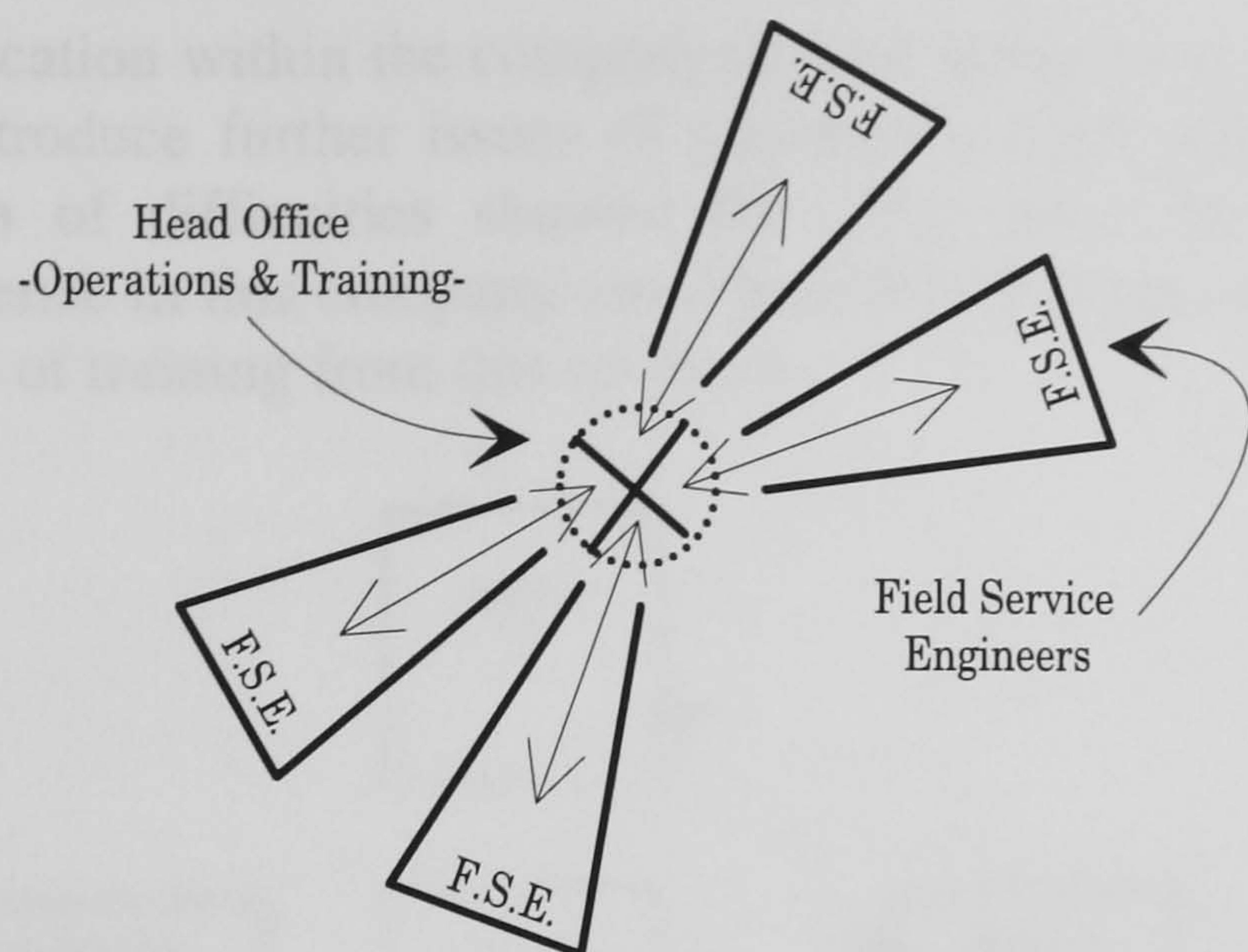
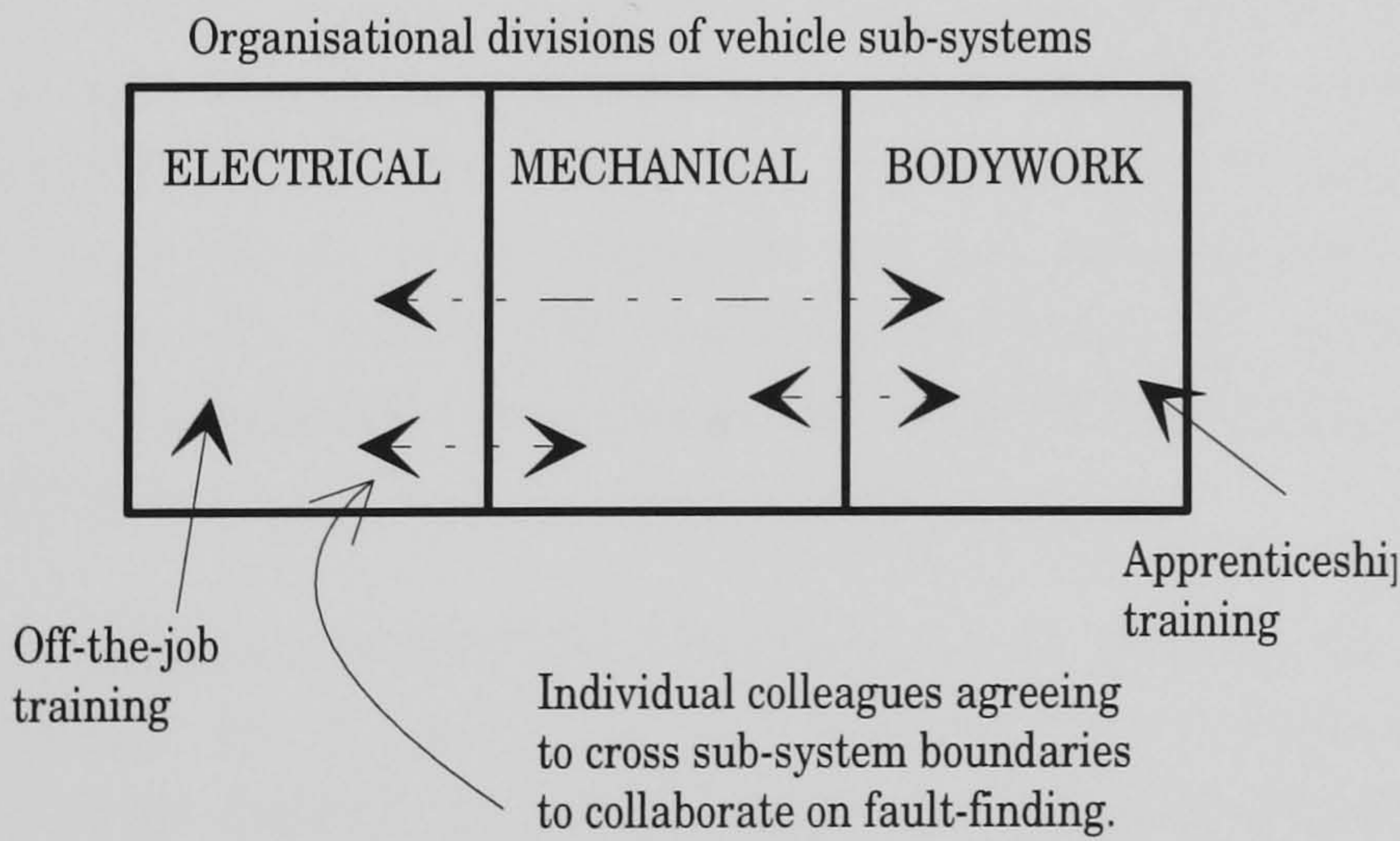


Figure C.3 Conflict in training exploitation with organisational structure

The closed functional boundaries operating in the transport servicing company caused profound limitations to the performance of training, Figure C.4. The internal operations of the company prevented staff from being given time to apply the use of the materials. The concept of shared information as a holistic approach to fault finding had been recognised to some extent by the fitters themselves. However, the division of the workforce into traditional ‘craft’ sections resulted in vehicles being passed from one section to the next with the cause of faults being known by one department waiting to be discovered, again, by the next. Poor communication also reflected the closed nature of previous training where the expectation of training was that of people being ‘sent away’ on a training course, to return and carry on as previously. The recognition for multi-boundary consultation was evident, but seemed unlikely. These experiences confirmed points 1,2,3,4 and 5 above.



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Figure C.4 Organisational boundaries by vehicle sub-system

Figure C.5 represents the isolated context in which each shift operated in the plastics company. The shift times did not allow a change-over period, though this was informally established between those charge-hands that were interested. There had been improvements made since the introduction of the training package, but these largely originated from the engineer with responsibility for training. Changes in the external market for the product threatened the survival of the entire company and this was having a marked effect on interest in training (point1). The training proved difficult to link to

Appendix D

operations and communication within the company did not adequately focus on general operations enough to introduce further issues of passing-on fault information. In this case the overall pattern of difficulties showed the clear need for multi-boundary consultation. The experience in this company confirmed the relevance of points 1,2,3,5 and 6, to the exploitation of training from this resource.

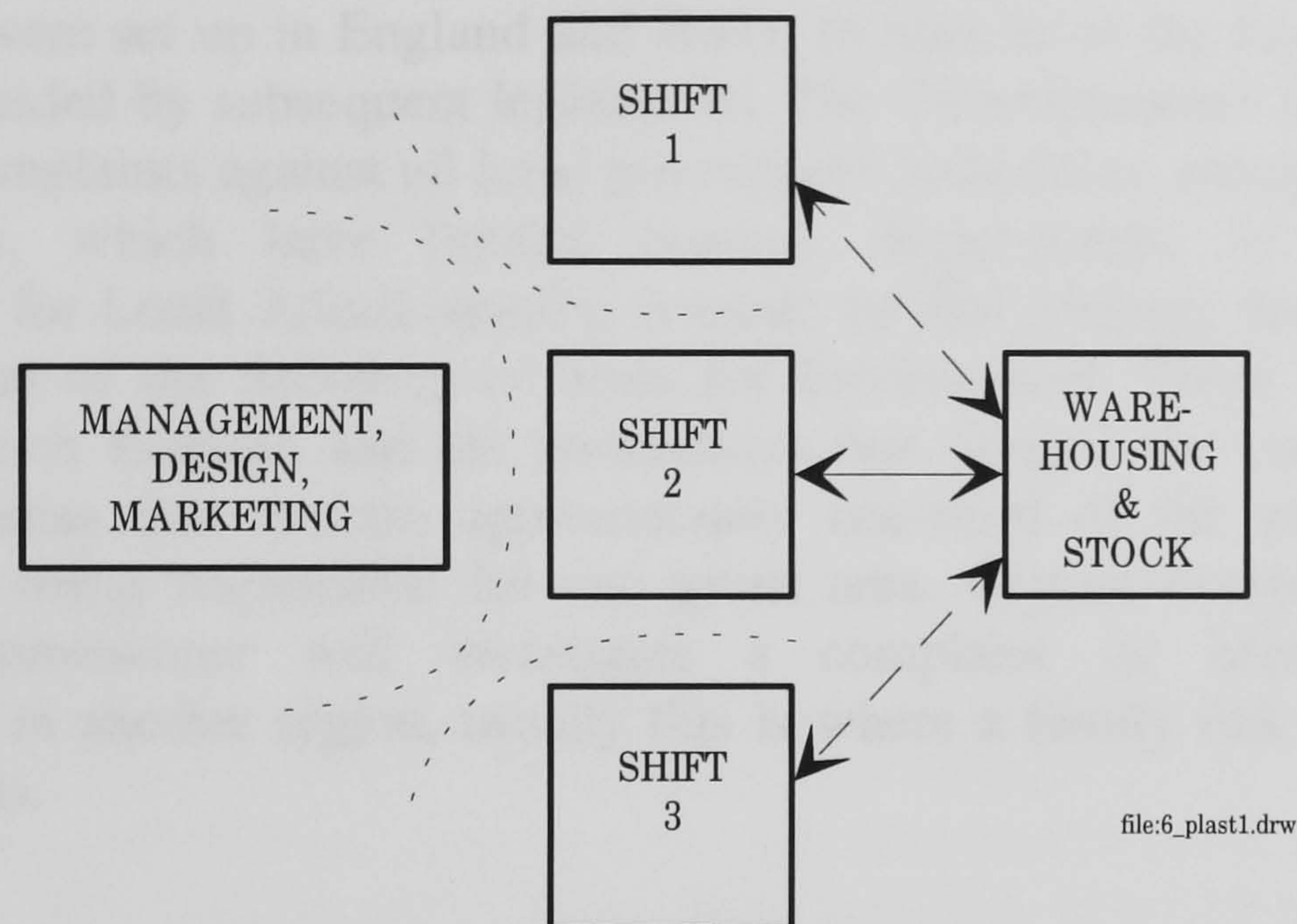


Figure C.5 Operational boundaries preventing communication of faults

Appendix D

The Commission for Local Administration (CLA)

Commissioners for Local Administration, commonly called Local Government Ombudsmen, were set up in England and Wales by Part III of the Local Government Act 1974 (amended by subsequent legislation). The Commissioners have jurisdiction to deal with complaints against all local government authorities, except for parish and town councils, which have limited powers. Appointment to the office of Commissioner for Local Administration is made by Her Majesty the Queen, on the recommendation of the Secretary of State for Environment. There are three Local Commissioners in England and the commission has divided the country into three geographical areas that contain approximately one-third of the population. Each Commissioner being responsible for one given area. Certain exceptions may arise where a Commissioner will investigate a complaint on behalf of another Commissioner in another region, usually this is where a family link of relation to a complaint exists.

Complaints and the role of the investigator

The Commission's main function is the investigation of complaints by members of the public about local government, though increasingly they are offering local authorities advice on administrative procedures for good practice, and how to run their own complaint systems. Each complaint referred or forwarded is first examined to ensure that it is within jurisdiction, and to assess whether further information is required, this is usually from the authority against which the complaint is made, before a decision can be reached on the extent of the investigation required. The possibility of satisfactory local settlement of the complaint without formal investigation is also considered. The great majority of complaints are not investigated to the point of issuing a full report, usually where the evidence discloses no personal injustice or maladministration, the complaint turns out to be invalid for various reasons, or the matter is already settled.

Maladministration is the term used by the Commission to identify the failures by local authorities which occur as a result of not providing or following established procedures to administer the fair and just execution of their responsibilities. Injustice may or may not occur as a result of maladministration but the majority of complaints allege injustice arising from maladministration. These occur from a wide range of local authorities with a view to securing appropriate satisfactory redress for the complainant and better administration for the authorities. Local Ombudsmen are concerned only with the way in which decisions are reached or action is taken, and whether the individual was unjustly treated. Therefore they cannot otherwise consider the merits of what was done or decisions that have been made unless they were taken with maladministration. None of the Acts establishing ombudsmen in the UK define the word 'maladministration'. A decision based upon arbitrariness, malice, bias or discrimination is likely to be held to have been taken with 'maladministration'.

Findings usually involve behaviour such as neglect, delay, incompetence or failure to observe established procedures, errors of inadvertence as opposed to intentional fault.

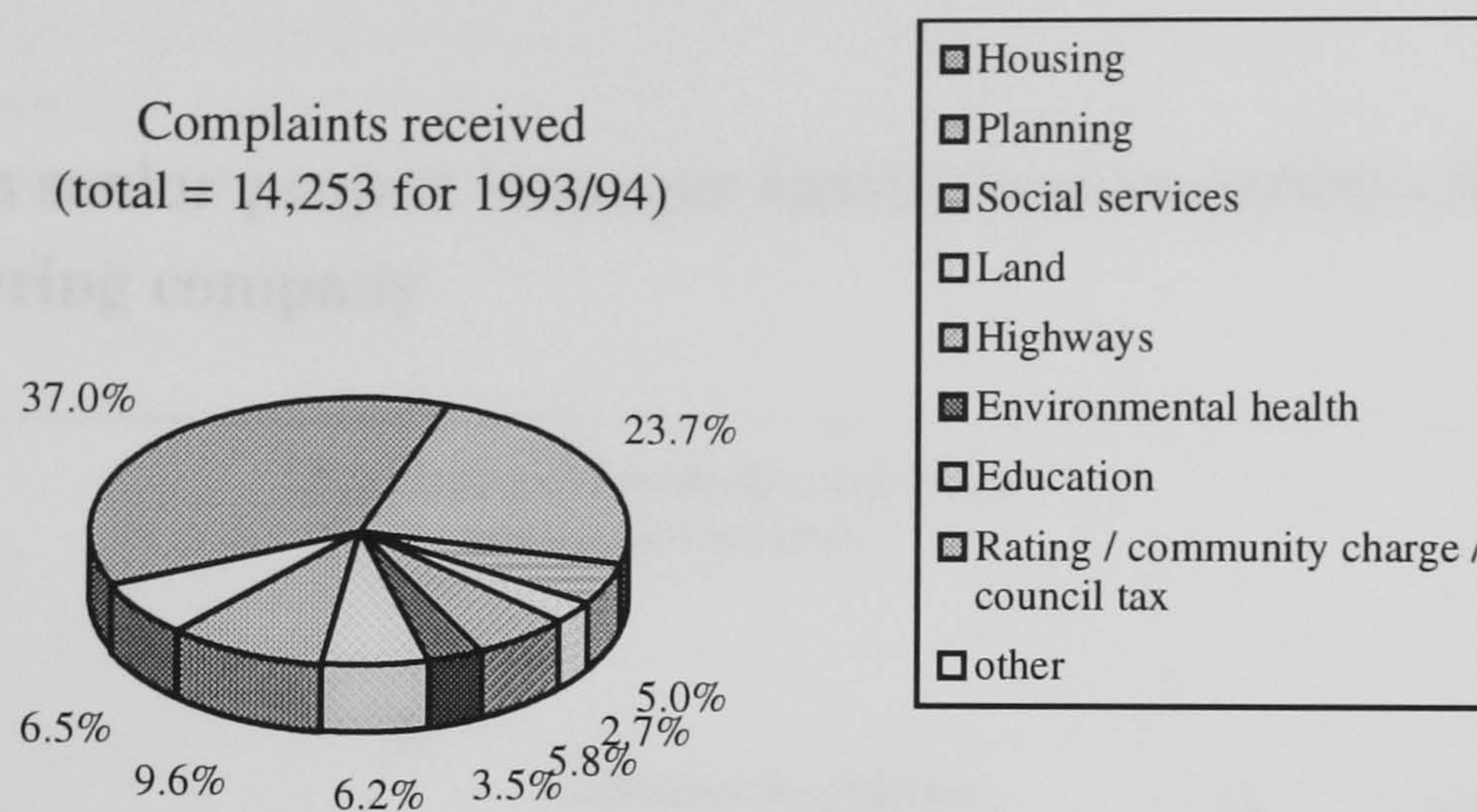


Figure D.1 Complaints received by category for all regions (op. cit.: 36)

Up until The Local Government Act 1988 complaints had to be referred to the Commission by a member of the local authority. However, from this date members of the public have a choice to ask a member to refer their complaint or else to send it in direct himself. This opportunity to refer directly to the Commission is known as 'direct access' and precipitated a major growth in complaints. In 1974/75 434 complaints were registered; in 1987/88 there were 4,128 complaints considered. In addition as all complaints must be submitted to the Commission in writing, and not all complainants are able to meet the need to correspond fully with the Commission, Investigators have increasingly needed to visit both complainants and local authorities. The tightly bounded remit of the Commission also affects the role of the Investigator who must determine whether or not the complaint is within jurisdiction, and if not advise appropriately how the complainant may pursue his grievance. For example spending decisions by local authorities which may be felt to be harsh by individuals, especially when compared with neighbouring authorities who may operate different spending policies, may be outside the remit of the Commission if it affects all or most of the Council tax payers within the Council's administrative area.. Unless maladministration in the process of the decision itself can be shown then the complaint is outside the Commission's role. Many complaints arise from areas of council activity where resources are scarce. Here Mrs P. A. Thomas [Ombudsman for the northern region] draws attention to this in her report, referring particularly to the provision of 'special educational needs, the provision of aids and adaptations for disabled people, and the award of improvement grants for homes.' She says:

'I have not been critical of councils who have in effect introduced a rationing system for limiting the number of applications they approve', provided that such systems operate fairly and councils have done all they can to secure the resources needed to meet their responsibilities in this area.' (op. cit.: 8)

Clearly the investigator's role includes one of explanation and clarification as well as that of information retrieval.

Appendix E

Interview with a senior project manager having responsibilities for training in a civil engineering company

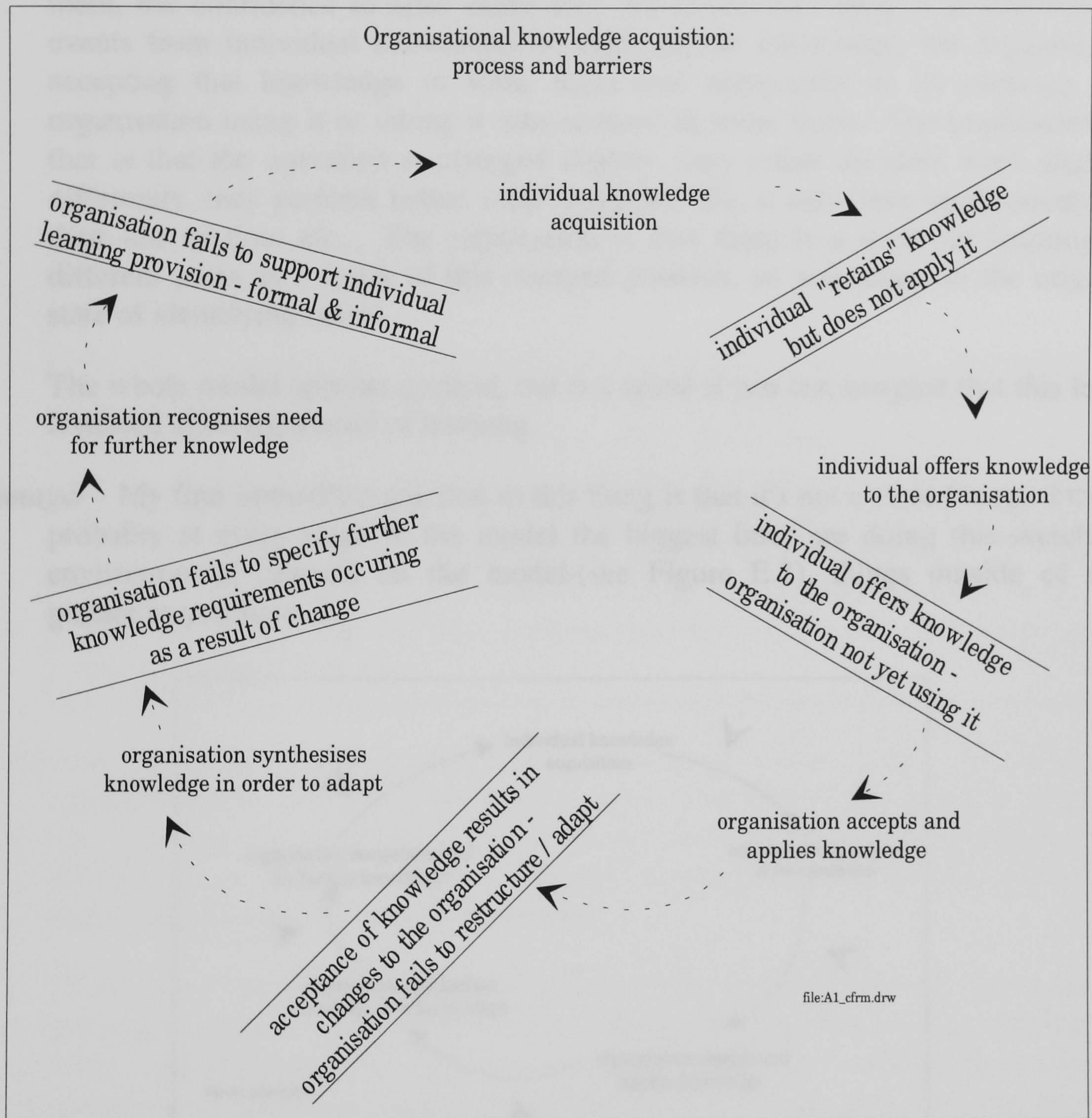


Figure E.1 Model of failures in the training cycle

Researcher - The model faxed to you previously (prior to the interview taking place), and referred to here (see Figure E.1), is developed from the work of other writers and comments from trainers in a variety of companies. It refers to the explanation by many trainers as their training being that of a cycle of events though this may or may not appear as such in practice, particularly from an outsiders view. They would see this sequence of events starting, at any point, e.g. (referring to Figure E.1) with the individual and knowledge... for it to be of any benefit they have to apply their knowledge in the organisation (this block here), and the barriers to them applying their knowledge in the organisation occur at this point where an

individual retains the knowledge but isn't using it. If you like, this is an example of the barrier between these two stages. And the factors that affect this barrier are placed on either side (refer to Figure E.1). These can be characterised in this case by: learning ability, learning experience, their commitment and decisions to learn and their motivations, and on this side that factors affecting their ability to apply the learning in the company relate to organisational factors as well as their own individual characteristics, e.g. the time they have, the opportunities or value to them, the confidence to error make etc. So if you like there is a sequence of events from individual knowledge, to applying the knowledge, the organisation accepting that knowledge in some form (not necessarily in its entirety), the organisation using it or taking it into account in some form. The implication of that is that the operation is changed slightly, they either do their work slightly differently, they perform better, more competitively, it may have implications for their use of time etc.. The implication is that there is a need for learning in different areas as a result of this changed position, so you return to the original state of identifying needs.

The whole model appears cyclical, but is a spiral if you can imagine that this level is nested upon each level of learning.

Manager - My first immediate reaction to this thing is that it's not a closed loop. I think probably at every stage in the model the biggest lines are doing this-sketching environmental impacts on the model-(see Figure E.2), things outside of this picture as you have it.

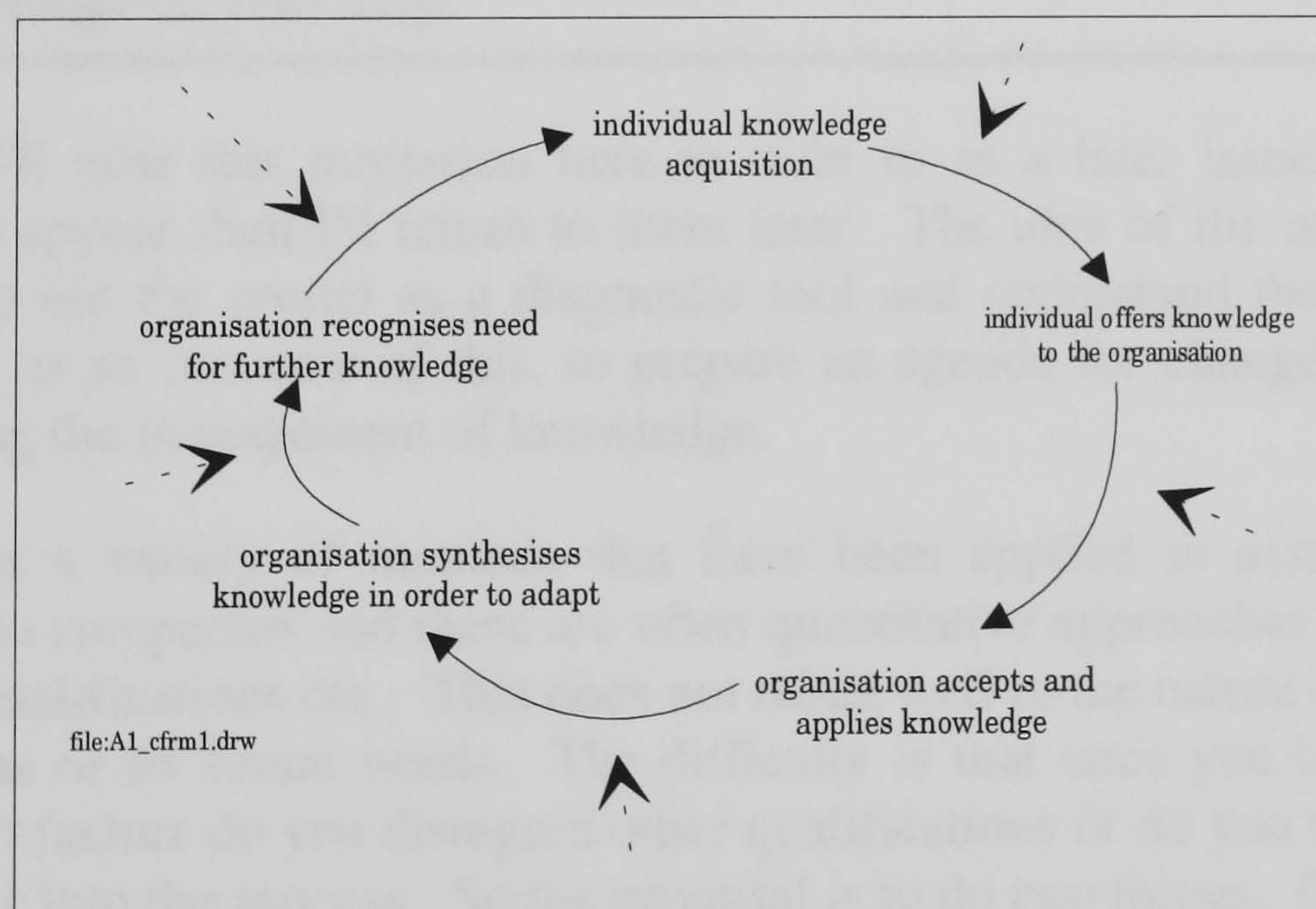


Figure E.2 External factors to the training cycle

Researcher - Outside the boundary of the picture or outside the boundary of the company?

Manager - Some of them are influences beyond the company affecting the company, some of them will be internal to the company. Things like for example, the economy plunges in to recession and you make thirty people redundant because you haven't got any work for them, and you wait two years and then you have

work and you don't have any knowledge any more because you threw it away. Now that is a huge change for the company but it is not being provoked by your knowledge acquisition exercise, it's being provoked by a completely external influence and I would say that most of the time it is those external factors that have the biggest influence on your knowledge acquisition / utilisation needs and how they operate. So that, take another example, you've got a really good training programme, you've got new staff coming in as University graduates, you put them through three or four years of excellent, well thought out training which is just the right sort which prepares them brilliantly for their future in engineering. The consequence is that a large majority might leave than would do otherwise if you gave them lousy training because they have actually been better equipped to get jobs elsewhere. The other result is that if you give them excellent training they might feel some loyalty to the company and they might want to stay there., But...

Manager - :(referred to in Chapter 7)

one of the problems with training and this is particularly recognised in organisations like local authorities **where they often have** very expensive **well structured training** programmes **but they don't have** particularly exciting **career paths** for middle management, so **people go to them** for this very well structured training, **wait five years and then leave**. And this can be a very big external influence on your organisation's knowledge resulting from the training which you spent money on. You see you put knowledge into all your junior staff, you feed it in, and then it filters out the door again. So you've got a haemorrhage on your loop.

Researcher - I'll note this migration here to refer to as a later issue. As additional elements appear then I'll return to them later. The idea of the model is twofold. One is to use the model as a diagnostic tool and understand the processes, then secondly as an outcome of this, to prepare an agenda for change that focuses on improving the management of knowledge.

There are a variety of methods that have been applied to assess the value of training in companies and these are often quantitative approaches e.g. totalling the NVQs, qualifications etc.. This does not relate well to the nature of the company's operations or its future needs. The difficulty is that once you take into account those two factors do you disregard other qualifications or do you integrate them in some way into the process. So the proposal is to do two things. One is to find out how good this model is as a diagnostic tool, and the other is to prepare an agenda for change as a next step. Once I have done a number of these interviews I will be able to see how useful the model is itself. If I were to keep updating the model each time I interviewed then there would be no continuity. So as I'm using civil engineering as a knowledge based industry, what are the factors that determine the knowledge acquisition in the firm? You may like to think of them as structured and unstructured.

Manager - I'm trying to focus on what you might call the gremlins in your model. The things that might throw it off key. The first thing is that people arriving as graduates are already intensively pumped-up with knowledge. Particularly now with four year degree courses on civil engineering, very focused and very vocational. It is pretty well recognised in the industry that what they have learnt will be very little applied. It is a running debate, but you take a guy with this pot of knowledge (100%) and this bit down here never gets used (70%). It will either be either too theoretical for the normal applied work of the average engineer or it will be on disciplines in engineering that he never gets into. Like my knowledge of hydraulics which I've never used since I left University, that type of thing. So this big chunk of knowledge which you bring with you which is not very much use even though it was acquired with a career in engineering quite deliberately in mind, that's the first thing. So you get to the company with your small chunk of knowledge which might be useful. The next point I wanted to make is that training is partly deliberate i.e. that which results from conscious training, conscious home study, whatever else you might do to become more knowledgeable, and it's partly not structured in the sense that as you do your job you learn things, even if you aren't undergoing any training at all, you weren't trying to get a qualification. If you are doing a demanding job which requires you to take initiative, take responsibility and do quite difficult things you learn a lot as you go. So you take someone and you put him into a new discipline, he learns a lot even if you are not training him. And I think my view would be that the non-structured, on the job, learning without trying to, accounts for the vast majority of useful learning that goes on in the organisation. And the bit that is done deliberately, and structured and imposed upon people, or imposed by their conscious desire to learn is probably only (it's difficult to put numbers on it but) 20% of the useful stuff they learn comes by that route and the rest comes by just doing your job. Take a specific example of the tunnel I've just been doing. We're trying to write a chunk of specification for a contract on a particular aspect of how you make tunnels watertight. I know a certain amount of this from background and past jobs and so on. In order to write a really good specification at the cutting edge of knowledge (I'm not quite there yet), in fact what I do is turn to one of my assistants, a graduate engineer with about four/five years experience, and...

Manager - (referred to in Chapter 7)

I say to him, 'go away and find out everything you can about this'. And effectively I'm mandating him to spend maybe two days, twenty/thirty hours in the end maybe, researching this quite narrow topic as part of the project work. Now if I authorised twenty or thirty hours of formal off the job training on this particularly narrow subject somebody would say that's a waste of money. But so long as it's an essential part of delivering a project to a client, nobody even thinks about it. And the purpose is to get a contract document not to educate that guy, but as a consequence of what he's just learnt about water-tightness and durability he's just succeeded in writing a short paper to be published in a tunnelling journal in a couple of months, on water-tightness and durability in immersed tunnels. His ability to do that has been driven purely by what he has

learnt on this project, he's had no formal structured training on that subject at all it's just come from his work. Because so long as it is part of his work it tends to get large chunks of his time. And also **I feel that people learn best when they have a very good reason to learn.**

So if the guy is sitting there and he's got to write a contract document and it's going to be delivered to a client in two weeks time as a first draft, it has got to be done. And how he is perceived by his organisation his superiors in the company, and how he is performing in his job is measured directly by how he manages to deliver. And so although he is not focusing on learning he is focusing on delivery, you learn very well like that. Your parallel, maybe I have to force him to take a day off on water-tightness. He sought authority to go to an off the job training course on a particular form of contract. It's a form of contract that we are actually using on this contract, but his particular responsibilities haven't been about writing contracts they are on writing particular forms of specification. So he went on two days and he learnt about that form of contract, but my instinct would say that he would be learning more slowly, more laboriously and less effectively on the off the job training than when he was on the job. You don't always learn effectively on the job, but you happen to when you are faced with a new subject under very high pressure.

Researcher - Within very defined boundaries?

Manager - Yes that's right and it is under those circumstances where most people pick up most of their knowledge. So all that is about knowledge acquisition.

Researcher - Do you think the nature of the boundary of a person's research is important, or is it the performance pressure that is critical?

Manager - It needn't be tightly bounded. Take myself as an example, I got appointed project manager on the "... (project)" tunnel three years ago now. Purely for the purpose of delivering this project, nothing to do with knowledge acquisition, because the company don't have many people with expertise in this area and I'd worked on another tunnel which is also an immersed tunnel. The work I had done on the other tunnel had actually been on the tunnel approaches and not on the tunnel itself and I had been at a much more junior level seven years ago at the time. So, I didn't know much about immersed tunnels and now I do. And since I started on this project I've had no formal off the job training on immersed tunnels and have made no conscious effort to acquire knowledge in the subject. But I now know a lot which I didn't before and I hadn't focused on a specific narrow subject. My role has been a very managerial, client liaison overview of the documents type of role, but I know a lot more about the subject than I did before. I have done some reading around the subject and I have been to a couple of conferences and so on but it has always been driven by the work.

Researcher - You mentioned your work example of the person you manage who has written the article in the tunnelling journal. Is that his own choice or is there time available in the company?

Manager - That's a situation where the journal came to our company as particular experts in this area as they were doing a special feature of immersed tunnelling. They phoned our regional MD and asked, can you come up with something of interest on this topic. And he spoke to myself and a colleague on what could we come up with and we focused on this theme. It's of interest as there is a lot of contentious debate as to how to deal with these problems but it was our graduate engineer who did all the work as he actually knows more about the subject, the fine detail of the work than anyone else. He came to be asked because he had acquired the knowledge in the Co., but to answer 'what was the Co.'s specific attitude to him doing it' he did it in company time. But the reason for that is nothing to do with training, it's to do with marketing. To have your company appear in auspicious journals is considered good value. It probably took him a week and then someone else probably spent a day editing it and vetting it, and that is considered good value in a field where our name is well known. and we want to keep it that way.

Researcher - That is interesting because as we move on to the area of 'applying the knowledge in the firm' a factor noted is the freedom to 'error make' and the preparedness to share knowledge 'gatekeeper effects' i.e. the tendency not to pass on information as control is retained by not passing on information. So do you recognise these factors in your firm or are there measures in place to overcome these problems, either by positive action or other incidents that stop these factors becoming a problem? i.e. factors that affect the individual using their knowledge in the firm once they have learnt (by whatever means).

Manager - (referred to in Chapter 7)

A few reasons occur. The commonest biggest reason is that they've got the wrong knowledge. Usually through no fault of their own. Either because training was badly focused or because past experience isn't relevant to present problems. So we have some people who are quite expert in certain aspects of highway design. In fact we have too many people like this as it is a market that has shrunk as a result of the governments change in policy in the roads programme. So there is a lot of people who are experts in highway design, carriageway construction, drainage and we have a workload which we can't cope with, but it's not in that area. **These people have got the knowledge but they are not applying it because we haven't got the work to give them. That is much the biggest cause of not applying knowledge.**

Manager - (referred to in Chapter 7)

The next cause of not applying knowledge is what you may call a managerial deficiency, i.e. the poor management of individuals. Where you have an individual working for you who through his training (knowledge / ability / capability to do certain tasks) and you don't stretch him to the full you fail again. **So you've got someone who is actually capable of doing something quite difficult and you don't let him do it because you are far too inclined to do it all yourself,** so you have knowledge there, you have ability there and you hang

onto the work and do it all yourself. And you ask your subordinate to do mundane things which are well within his capabilities instead of difficult things which will stretch him. There is an immediate loop here back to your first box, which is that if you don't drive an individual to use the knowledge he has, he learns more slowly. Because people learn more when they are pushed.

The guy who is struggling a bit will be learning more than the one who has done it all before. So that is probably the next biggest reason for the knowledge which individuals have not being applied.

Researcher - For someone who has been on a course, how often is the connection made between the outcome of the course and the expectations of what they should be able to do or know when they come back. Take the example of the person learning standard contracts. Will he be expected to work on standard contracts when he returns?

Manager - There is very little attempt to link an individual course to what the guy does next in his job. We send a guy on a course on conditions of contract, it probably has the beneficial effect that he has a broader understanding of the project that we are working on now. That is one benefit, the second benefit is he will almost certainly be dealing with conditions of contract in the foreseeable future, though I can't focus on when, because I work in a project based organisation where whatever work comes in is any guess. There are examples where individuals retain knowledge and use it in some form as power. You used the term 'gatekeeper'. This usually occurs in situations where an individual is threatened. This has occurred in our organisation when there are a number of specialists who support projects and whose role is threatened during difficult financial times, such as now. A recent example of this is the quantitative surveying section. The standard procedure for this task was changed some time ago from engineers preparing their own bill of quantities, to a separate department performing this function. However, when more recently we've needed to give clients a rough estimate of project costs we've had difficulty in getting these approximations from the department. The answer has been to submit a spec. and then they will provide a completed bill of quantities. The practice of diminishing this specialised task is, in the eyes of this department, a greater risk than assisting with simplified information for a client. Unfortunately this has the effect of separating the department from the day to day works and further reducing their effectiveness. Not all specialist will perform in this manner and an example from our legal section is where I can ring for an opinion from this person and he will give me an answer with some indication of how confident he is about it. He will then ask me if I want him to go away and investigate it in more detail. This provides me with the information I need and some idea of its certainty which I can then judge as to how important it is and whether or not I need clarification.

Manager - (referred to in Chapter 7)

Another situation where information is retained but not used is when the resources or facilities are not available for them to be used. In the case of CAD this has certainly happened. **A member of staff goes away in a specialised staff training course**, he learns a range of new features and gains expertise, **and then returns to the workplace and the equipment isn't available**. He is unlikely to remember all that he has learnt without an opportunity to practice, and although he may learn quicker than otherwise when he eventually gets the use of the equipment, the lack of resources prevents him applying knowledge for the benefit of the firm.

Researcher - The lack of resources is a frequent example of companies preventing the application of relevantly acquired knowledge, but are there circumstances where the focus of training itself is at question or creates difficulties in knowledge acquisition by the firm?

Manager - Management training is a different type of example where this may occur. We have situations where someone says I would like a different type of training, 'I'm getting into a different type of job than I've done before, and I've found this course which is a four day course on intensive general management training, and will you send me on it...?', and someone says, 'yes'. The guy goes and gets perhaps quite good intensive training. Good interactive stuff, role playing etc., comes back fired up with new ideas. And he then sinks into oblivion because nothing has changed in his job, he hasn't got a job to do which means he can implement this knowledge and nobody is terribly interested in what he has learnt. I had a particular example of this, a guy who was in a middle management role, he was here about two or three years ago doing the job I'm in now. He managed to persuade the company to send him on a three week course to Sundridge Park which is a well renowned management school. It cost them about three thousand pounds I think, plus three weeks of his time. He went off on this course and at the final debriefing the course leaders said, 'that on returning to work all the people on this course were going to experience one of two things. Some of them were going to go back, they were going to be grabbed by the throat by there management and going to be told, right you've just had this huge amount of money invested in you, you must have learnt something new, they'll be given a head and told to make something of it. And they'll be really given their head and told to do something which they weren't doing before and they'll feel brilliant and feel they've been promoted even if they haven't. And they'll go sailing off and do big things and benefit massively from the course.

Manager - (referred to in Chapter 7)

Sadly there's another group of you, and it's quite a big group who'll go back to **your organisations** who although they **sent you on this course, weren't very clear as to why**. They'll assume it will just make you better at your job but won't give you the recognition for what you've done and they won't ask you to do anything new, and indeed probably what they'll do if you push them with new ideas is they'll explain very nicely why they're not quite appropriate to the

current circumstances. That group of you will get very depressed over the next six months and you'll feel like your jobs a waste of time.' And he fell into the second category,...

...he came back, nobody grabbed him by the throat, and indeed he had to stick his head above the parapet and start spouting ideas and sure enough, he suggested a new idea and the manager listens to it carefully, or appears to, and then he tells you what is wrong with it, or why it won't apply here or why it will be too difficult to change, then he dismisses it. So that is an example where knowledge is acquired and not used by an organisation and it is utterly the organisation's fault. They have actually positively encouraged them to go and acquire knowledge and then they've been given the opportunity to make the most of it and then failed because of what they choose to do next. It depends a great deal on the nature of the training and the knowledge acquisition that is going on how big a deal you should make of it, but if you are sending a middle manager on a three week management course you should be doing something a bit dramatic afterwards.

Researcher - When they sent him off on the course and he was deflated by it, did he say if any of the other candidates had been asked on their return what they had done or did people specify, even when buying the course what they wanted, or ask for specifications about the course itself?

Manager - When talking about training selection, the detail I receive and am able to obtain varies enormously. I get approached regularly by people seeking off the job training, which we have to fund and I have to approve, and I'm new to this job so I'm not doing this as well as I'd like to be, but just to give a few examples.

Manager - (referred to in Chapter 7)

One thing that I might have someone seeking training on is design standards for bridges. There are a number of basic design **standards** which we use in huge quantity, **all our junior engineers** slog through them and **have to know them inside out**. And so a lot of people run a two day introduction to the basic design standards in bridges, B.S.5400. And we've managed over the years to establish one or two suppliers of this type of course who do a reasonable job, I don't have to get in to the detail of the course as it's on a specific technical subject and I know it will be useful. **So that's a clean cut case** where we know what is in the course and we know it'll be utilised fairly directly, fairly quickly thereafter. Another example but different is Health & Safety training. We now have a certain amount of obligation in law to training people in Health & Safety, and we have a certain need from a marketing point of view to be able to deliver jobs to staff who have Health and Safety training. Therefore if somebody seeks training in the Health & Safety area or training relating to new government legislation, new legislation has just come out, the construction, design and management regulations which are all H&S and there are courses running on that at the moment, and I can't turn-down someone who wants to go on a course for that because it will undoubtedly add to our marketing effort.

Because we need to be seen to be knowledgeable in that area of new legislation. Even if the manager cannot be used directly in the work he can be used in the bid submission in somebody's CV. So that sort of training is easy to judge if it's worth while.

Let's take an example from the other end of the spectrum. Every junior engineer trying to become chartered wants some training with local management on it. One of the things that they go for is various suppliers of training which is broadly in the Outward Bound mould, 'active management courses' as some people call them. Go rock climbing for a weekend and call it work, a cynical view. They do sailing courses and spend three days sailing in the Channel on a seventy foot yacht. But it can be argued that it is an excellent way of teaching people about the importance of teams and in getting to relate to people you don't know and all these sorts of things. If I sent somebody on a course like that, firstly it's very difficult to see how I can identify a need for someone to go sailing for three days. It's equally difficult to know how I'd measure something afterwards whether they've learnt something useful in the delivery of our product to our clients. I suspect that such things are three quarters of the time a waste of money, the reason they are not a waste of time is where someone is actually very interested in the management subject that is supposed to underline the course. So if you send somebody on a weekend of sailing which is supposed to be an active management course, he's been reading management books and he's getting into the management role for the first time and he's interested in how you manage people and how you motivate people and he goes on a three day sailing course, all weekend he'll be trying it out. And maybe if he's in the right position at work when he returns, he can try it out and he may have learnt something. But I fear that for 75% of the time it is three days of off-the-job training which they need to accumulate the right quantity of off-the-job training, it's a hell of a good time and they don't do much thinking about management. But it's a good example of where it's very difficult to judge whether the training will be of any use.

Researcher - When you referred to the training specification you referred to the limited details available to managers and also the extent that a manager may understand the implications of sending someone on a training course before they are sent?

Manager - It's a real problem. As a training manager I'm inundated with course literature. I got onto our central training department which is only one person now and I asked her, do you get a lot of course literature, and do you attempt to collate it in any way so that you can inform people. She said, 'well I used to compile a summary of all the courses available but now the Institution of Civil Engineers do that. They produce a booklet about once every four months which contains a summary of a lot of courses (not all of them), but that there was too much overlap. It's a very time consuming exercise.' So she stopped doing that. So I then asked her did she have any intelligence what a good course is, what a bad course is. She said people complete a feedback form when they've been sent on a course, and when I asked what happens to these forms she said she put them on file. But nobody is actually collecting data of, this is a good supplier of training, this is a lousy supplier of training. And so when everyone is inundated with data anyone is

capable of packaging it so it looks professional. That's quite easy, but trying to identify what is good training is very difficult. You rely a lot on the reputation of supplies and where it is individual lectures you rely a lot on the reputation of speakers who are prepared to speak at them. So if you get a lecture on contract law, there are a handful of names which are reputable speakers and you know if one of them was there you'd know that it was going to be a reputable course because otherwise they wouldn't go.

Researcher - The model refers to the acceptance of an organisation to change and its ability to accommodate change. This reference in the model asks how a company can increase its accumulated knowledge and therefore be more adaptable.

Manager - What do you mean by accumulated knowledge?

Researcher - Knowledge accumulated in its procedures, its practices and also within the individuals themselves but where it is made accessible to the organisation. So your reference to databases built by the organisation is one of these areas, specialists who communicate will be another area, and systems that encourage people to communicate their expertise would also be an example.

Manager - (referred to in Chapter 7)

This is something off a bee in my bonnet for my particular company. We do accumulate knowledge, as I say mostly at random, mostly because of what you are doing. **A great deal of knowledge is accumulated, but very little energy is put into rendering it accessible.** So that when people need it it is a large effort to obtain it and it's little recognised but an obvious fact that when its hard to get at people manage without it a lot of the time, rather than get it.

Researcher - With what sort of consequences?

Manager - With the consequences that there are two or three layers of seriousness if you like. Ultimately you could have a situation where somebody fails to obtain knowledge that the company already possesses and therefore delivers something that is negligent to the client. The much more likely consequence is just money, that someone is going to a job much more slowly than they ought to. So we won't be an efficient business. So if you've got competitors that are better at making the knowledge available than you are they'll be able to do the job much more cheaply than you are with the consequence that you'll go out of business. So it's an old argument in the co. that we don't make our knowledge accessible, that we don't put time and energy into what we've accumulated.

Researcher - Is this a reflection on the company specifically or the industry sector?

Manager - I think its a characteristic of project based work, everyone is focused on one project. If you work in a process industry or manufacturing industry then you have a comparatively stable environment in which you have a particular thing you do, e.g., where you manufacture shoes, the style may change over the years and

you'll get more sophisticated ways of doing things, but ultimately there is a stable process will which will evolve very slowly. You'll find better and better ways of doing it, you get more productive but essentially the thing you are doing remains broadly the same. We don't have that, we have a much more changing task and we're producing a bespoke product for each client. We're not just producing the same units at different sizes. So we have the problem of massive variety in our work, work coming and going and no steady processes. Which removes the natural drive to accumulate knowledge as we evolve. It's very hard to evolve. Nobody is focusing on 'the big thing' going along steadily, everyone is focusing on the week or the month or the year of the project.

Researcher - Is it the size of the organisation or the focus of the project which causes this problem?

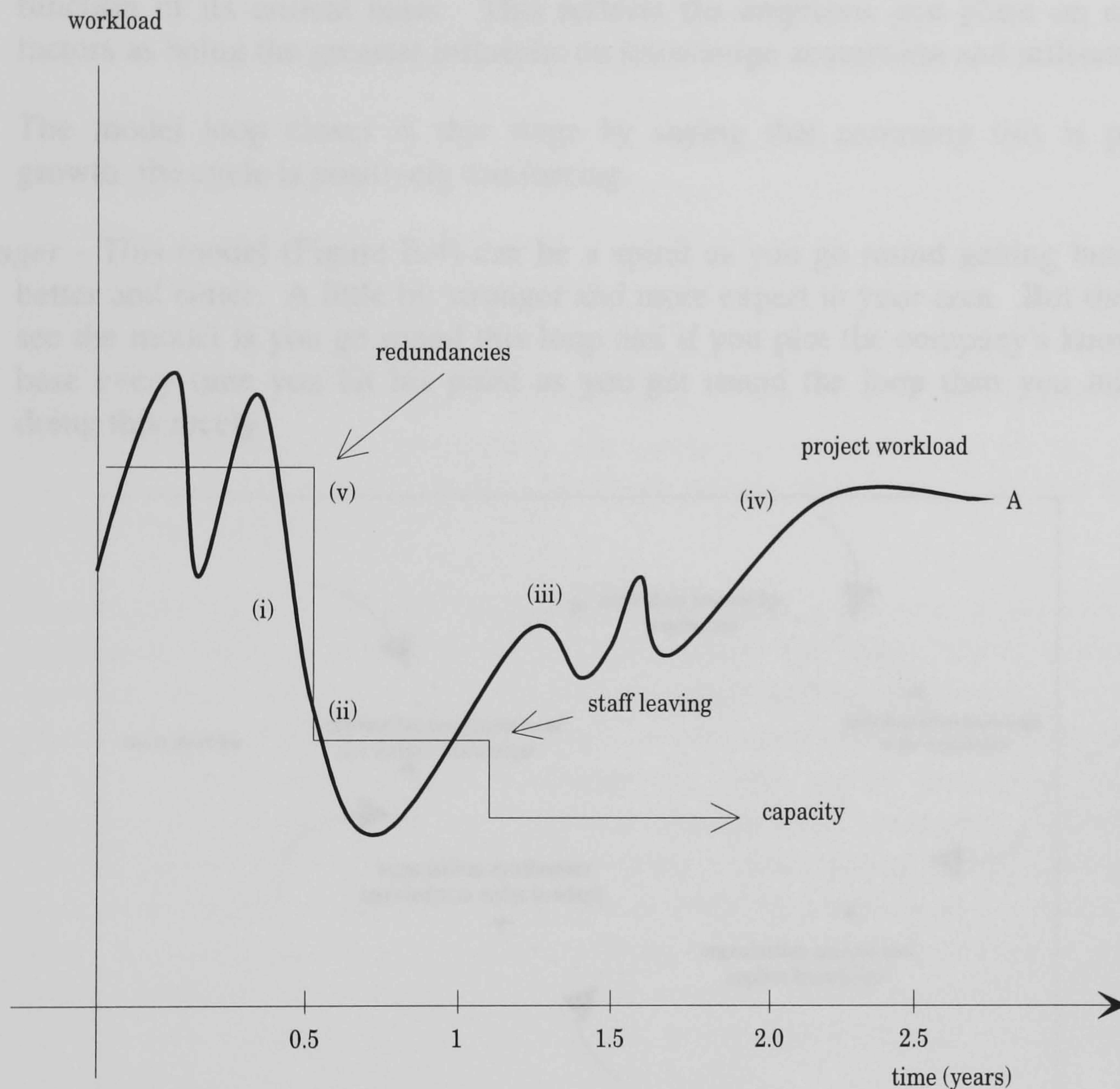
Manager - The point of company size is an interesting one. Current theories i.e. management consultants, is that engineering consultancies currently range in size from about three to four thousand people down to about one, and that they'll bifurcate. We're going to get organisations that are about three or four thousand which are multi-disciplinary, non-stop shops which can do anything for the client on the one hand, then you'll get companies which are up to perhaps a maximum of a hundred people who are basically in a niche market. They do something quite specialist and they do it very well. And they are suggesting that the companies which are like ours which are about seven hundred strong in the UK, multi-disciplinary, are either going to get bigger or they are going to founder. That's the argument that is going about at the moment. And I think there's a possibility that there is some truth in this. One of the problems is that it's a very competitive market at the moment, you need both to have a certain amount of cushioning against the hard times to get through three or four year long recessions and keep going. If your solution to this is to make massive redundancies, if that's the only way you can keep going, you are throwing knowledge away. So redundancies are extremely painful for a people based organisation. Much worse than it is in a steel works where you've got four thousand and you only need three thousand. To loose as we have done 15% of our staff is a hell of a painful loss of knowledge. So that's one problem where size helps. The other problem is that as we are coming out of recession as we are now. We've had a very bad time as a company, a lot of people are unhappy here and finally at long last there are job opportunities starting to appear elsewhere. And we are getting a bit of staff haemorrhage at the moment. At our size you can suddenly very quickly lose three or four people in one discipline and suddenly that discipline is very weak because you've got maybe only ten or fifteen people in a discipline to start with. You lose three or four of the better ones, because you'll always lose the better ones, and you are really suddenly teetering. If you are bigger you've got more of a cushion against that as well. So there does seem to be something in the case that our size of company is a bit on the small size of having a stable knowledge base that you can retain. When you are driven to redundancies you lose too big a chunk of specialism, and when people choose to leave you lose too big a chunk. You move too easily from an effective knowledge base to a totally inadequate one in a particular discipline when you are our size. Another problem with our size is that as I mentioned in

organising our knowledge, a library of CAD details for bridge details, bridge abutments and bearings, this kind of thing. All of these things which involve somebody investing time off projects when they can't allocate it to a project, by saying I can't allocate it to delivering a particular project, I'm doing something of use to the future. There is massive downward pressure on that all the time because if you're not working on projects then you're not earning money. And therefore you're vulnerable and people are reluctant to put any time and effort into things which are not specific to a project. If you are three times as big it's that much easier to set up this type of thing. Similarly to move the other way on both these subjects, if you are a niche market player of a hundred strong, you are not trying to meet the multi-disciplinary pressures and therefore you are less vulnerable to losing a handful of people in a particular discipline. Whereas a company of two thousand doesn't stand a chance unless it makes it's knowledge accessible, a company of five hundred tends to be bad at it like ours. I suspect it's typical of companies like ours. My previous company was about a hundred and fifty strong. And at that size you don't need to bother. Everyone knows everyone. Once you've been there five years you know everyone except a handful and so if I need something I know who to ask. In a company of seven hundred you don't. What you do is you think you do. If somebody gives me a subject in engineering and asks me to name a name I can usually do it. But I bet if they gave me a questionnaire of twenty five names I wouldn't get the twenty five best. I'd get the best subjects I know well. And then the subjects which I don't know so well I would miss the best because I wouldn't know that we'd got a guy in Newcastle who is brilliant at something, or a guy in Bristol, or in our London office, or a guy who's been seconded to Malaysia for six months. Because the company is too big for you to personally know everyone. So I think this pet theory that the companies are going to get bigger and smaller has some truth in it and I think it is related to what you have here. That the retention of knowledge at our size is very difficult because you can neither organise it nor rely on just networking.

Researcher - It also reflects on what is a niche market.

Manager - You can't sustain seven hundred people on a couple of specialisms because you have to be very flexible and to be able to move with the market. It means you have to be able to use your geo-technical specialists on either immersed tunnels or highways or bridges. And similarly your other specialists. The character of our company is that I can manage an immersed tunnel project because I have got a geo-technical specialist, I've got an electrical systems specialist, I've got a ventilation fan specialist and I've got people who understand concrete technology, I've got people who know about construction and I can turn to them all. But none of those people can I provide a full time job for from my project. So we have specialists dotted all around and we are all drawing on their expertise and they are all picking bits off each project. And you can only support the specialists if you've got enough projects. And I think that our size, we were nine hundred strong once, only a few years ago, I think then we were heading up to a level where you can support your specialists and keep them fed. Getting down to about five hundred and you're in serious difficulty and you start having specialisms fade away. Because you can't feed them and you have to be adequately multi-disciplinary, and

people will cease to come to you with their big difficult problems as a one stop shop. Because you haven't got all the specialists. So you need to be big enough. So you can see if you only have one project and you have one specialist in geo-technics, his workload, if that is a graph his workload it will do this (see Figure E.3, line A), because I have project work for him.



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Figure E.3 Influences to knowledge and work capacity in the organisation

If I have three projects his workload is starting to do this, and if I've got twenty projects and twenty specialists you've effectively got a straight line. So it overcomes the peaks and troughs. So you get to the point where this instability starts to happen and when you're down in one of these (i) and its six months to get here (ii) then you make people redundant. And this has been happening to us recently. I mentioned geo-technical because it's happened there. Six months ago we made geo-technical specialists redundant, in the last two weeks we've had three hand in their notice, and now though we're not shot in geo-technics, we're weak. And now the workload is going here (iii.). In a months time I reckon we'll be here (iv.) but the thin line which is capacity has been doing this. At this point (v) we drew it down with some redundancies and now the workload is climbing up, the capacity draws itself down by people leaving. So you've got one line

(capacity) going down and the other (workload) rising. It's all due to the fact that we can't manage our peaks and troughs because of our size.

Researcher - So what you are saying is the development of the firm and its difficulty in accommodating and adapting is substantially influenced by market factors. And even though the organisation may synthesise knowledge and adapt, it is largely a function of its critical mass. This reflects the emphasis you place on external factors as being the greatest influence on knowledge acquisition and utilisation.

The model loop closes at this stage by saying that assuming this is positive growth, the cycle is positively reinforcing.

Manager - This model (Figure E.4) can be a spiral as you go round getting better and better and better. A little bit stronger and more expert in your area. But the way I see the model is you go round this loop and if you plot the company's knowledge base every time you hit this point as you get round the loop then you might be doing this nicely.

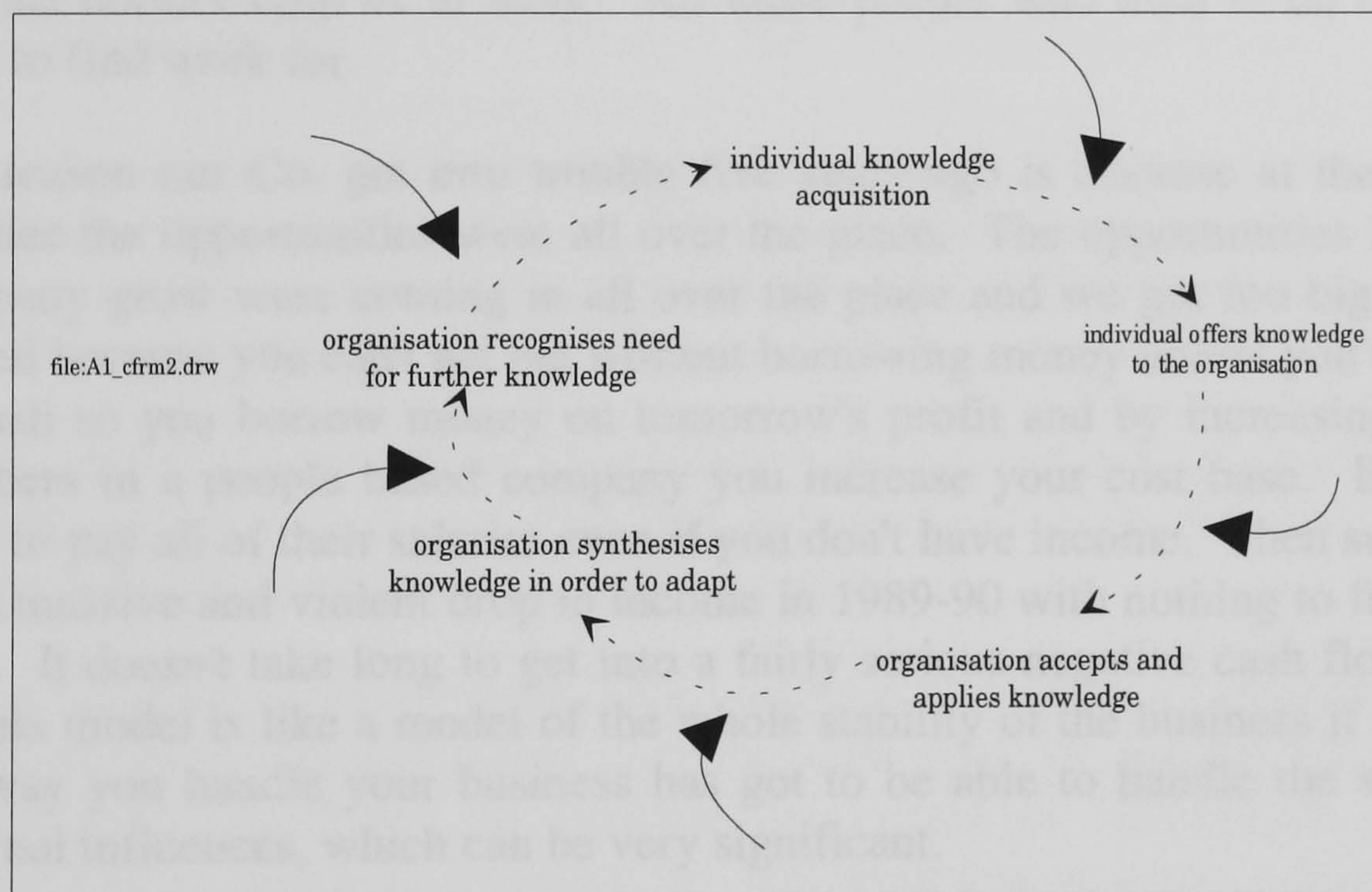


Figure E.4 Impact from the business environment

And it will be if nothing bad is happening. But over here you might get a haemorrhage of staff and over here you might get a horrible dip in the economy meaning you've not got enough work to do, when everyone is kicking about. And another effect of a hardened dip in the economy is you get big management upheavals. And that's very damaging to knowledge. Everyone gets scared. What we were describing as the gatekeeper effect in specialists, in our company we've had a particularly bad period of that in the last couple of years because everyone's been scared for their job. Everyone is fearing they may not be in a job in a couple of months time. Everyone is feeling 'the company is looking at me I must prove my worth.' People therefore focus in on themselves and not to the benefit of their department or the whole company. So you can climb the model and then drop at any stage. You've got to look at your loop as having things coming out of it at all stages and these arrows (pointing in from the environment, Figure E.4) are more

significant than these ones (pointing outwards - referencing knowledge gain). And the trick of the successful company is to absorb these punches when they are punches (a deficit in work) and to absorb them when they are benefits (an increase in workload) so that then you get one of these when it is a benefit, like the government announces a huge increase in the roads programme, you can either utilise your knowledge you already possess to increase your business and make money or not quite bother to. So if these good things are around you can jump up the scale and overcome competitors, but you've got to recognise that all of these are a case of trying to achieve stability and what you get if you do that too steeply is what you get if you get an increase in the roads programme is you take on thirty new experts. And then the government changes its mind because the taxes have gone up and they're embarrassed and they stop the roads programme like they did three months ago. They've just hacked a great lump out of it. We've had three projects terminated, big projects that employ twenty people each and have been terminated on three months notice. Projects that will run for three to four years and we were told on the first of July it's all over, wind it up. And they'll pay us a bit of compensation for terminating our project in accordance with our contract but that doesn't keep us in work. All those people who used to do that we now have to find work for.

The reason our Co. got into trouble five years ago is because at the end of the eighties the opportunities were all over the place. The opportunities to make the company grow were coming in all over the place and we got too big, too highly geared because you can't get big without borrowing money unless you've got loads of cash so you borrow money on tomorrow's profit and by increasing your staff numbers in a people based company you increase your cost base. Because you have to pay all of their salaries even if you don't have income. Then suddenly you get a massive and violent drop in income in 1989-90 with nothing to fund the cost base. It doesn't take long to get into a fairly serious negative cash flow problem. So this model is like a model of the whole stability of the business if you like, so the way you handle your business has got to be able to handle the shocks from external influences, which can be very significant.

Researcher - On completion of the model, as a diagnostic tool, how useful is it to evaluate what is going on, and secondly if it is of value, in coping with these 'punches' is it of use to characterise where improvements can be made in a company? Is it of any benefit to look at this as a process in this form to identify areas. Or are those areas already identified?

Manager - I think it can be. I have a couple of reservations. As we have talked round this loop I am not sure that this is a loop where you start here and walk round step by step. These could be seen as subjects all just relating to the same central theme by spokes if you like. Which aren't necessarily progressions around a loop. I think if we talked about things in another order we would have had just as useful a conversation and I'm not sure it would have been immediately apparent that it wasn't such a logical flow.

Researcher - That is interesting as training managers refer to this loop and put forward this view that it is a loop. But does what you say about the environmental factors break the loop or change its sequence?

Manager - It's almost not a loop at all. It's a loop in the sense that an individual undergoing training goes round the loop, but the manager has to have all these things in parallel and what he has to be doing in my current view is: 'I've got training costs - how much can I afford to spend, I've got the desires of individuals - what training do they actually wish to undertake and what do they think is worthwhile training, I've got training availability - training to match our specific needs. There's this whole mass of things. But what I think the training manager has to think about is not how those things relate to each other because I think that's rather obvious but how those things are impacted upon by the outside world. So my current view on training needs is going to be changing steadily more as a result of what is going to be changing in the company as a whole, and well beyond the company than it is as a result of training. And I think one of the dangers of the specialist training departments when you have a company of five hundred people which has five people labelled as trainers who sit in an office together and are not involved in the delivery of the product, then what they know about is the delivery of training. What they are interested in is the training process and I think that type of training manager is the guy who will be terribly interested in the closed loop and won't tend to look beyond it. My job is essentially about the delivery of our product and I'm a training manager on the side. Very much in that order of priority to my company.

Researcher - So you have responsibility to set priorities based on scanning what is available etc. but in negotiating that agenda how much difficulty is there in communicating that structure to other people?

Manager - I have quite cynical views about some of these things. Because I have the suspicion that if nobody in the company ever went on another training course, assuming it would still be possible for people to still obtain professional qualifications, which it wouldn't be, but assuming it were I don't think the company's commercial situation would change much. I don't think that off-the-job training is very significant in terms of the delivery of the work. I think it's more significant in peripheral ways. Obviously in the way that people need to obtain professional qualifications and off the job training is a professional requirement, that's the first one. The second is that if you give staff three days off the job for training it motivates staff, he comes back with new ideas feeling buoyant or both. And I think that simple motivation, 'the company spent some time on me', a break a breathing space, some time to reflect is probably more pertinent than the training itself. Which is probably why going sailing for three days is a good thing. But in terms of the actual delivery I have my doubts. Especially in a formal course where somebody goes into a lecture hall and they sit down in the lecture hall with forty or fifty others and listen to six others and then they come back. Because all you get then is what the guy lectured at you. Most engineers are lousy lecturers, they give crappy speeches. What I think is likely to be much more valuable is getting somebody to give a paper at a conference. Because if they give the paper they're

going to have to get their subject right. What they are actually going to do is go and do some home study and some reading and some hard thinking. They've then got to go to the conference where they'll meet other people working in the same discipline who will have critical and intelligent conversations with them because they've just presented a paper. Just attending a conference has none of these impacts because it doesn't concentrate the mind, nobody is particularly interested in you, you can wander round and be ignored. I've had two examples of this, a recent conference in Egypt on a working party on immersed tunnels. This concentrated the mind wonderfully. As part of the International Tunnelling Association's functional groups, I actually deliver what they do, I spent three or four days with other engineers working on immerse tunnels and I learnt loads. About how other people think, how countries do things, that kind of thing's very useful. Whereas in stark contrast last week at a conference in London, which was our subject area, I don't think our company or me gained anything from that because I was not participating, I was just there. And I learnt a little bit about subjects related to my work, but I'll drop it unless I use it. Taking an active part focuses the mind. Similarly if you send somebody to listen to six lectures they'll just attend. So I would increasingly look for training which put people on the spot and isn't necessarily labelled training, just experiences which force them to learn.

Researcher - So does this imply that the organisational acquisition of knowledge is implicit and inevitable?

Manager - My feeling is that we must acquire knowledge, we need loads of it, it should be focused as accurately as possible, we should be very critical about how we spend our money because training is expensive. We should put a lot of energy into finding out whether the training proved useful, and we should be imaginative about what we think of as training. We shouldn't be stuck with the idea that going on a course is the best kind of training. So what my subordinate did in writing this paper for the tunnelling magazine I could have written it or my boss could have written it and it might even have been a slightly better paper but the amount of learning he did to write the paper far exceeded what we might have done. This really put him on the spot and his name will be on the magazine, great. As well as a direct learning experience, it also means that because his name is in the magazine he'll get a copy and see his name against it and feel better. He'll feel I know something about this subject I wrote a paper on it. It is actually going to feel like his knowledge is significant and motivates him. So I think that's probably a better exercise in training than sending him on a course on durability of tunnels, which probably would have cost us the same.

Postscript - notes later discussion:

The difficulty in using models of good practice is that if the model doesn't seem to work the tendency is to rubbish it as if it has no value. This is particularly true where external influences are a factor in the difficulty experienced when using such a model.

There are two schools of thought or approaches to planning in uncertain environments; one says that 'I'm working on a project and there is bound to be difficulty with the sequencing of work and the financing of each element, therefore I must remain flexible, can't use a plan, and will take things as they come'. The other approach is that 'for the very reason that the environment is uncertain, I will plan the resourcing and procedures of the project so that when things are influenced by other factors I can accurately assess the consequences of these changes.' I find that only by taking the latter approach can change actually be managed. It is when there is a method of assessing the impact of change that the significance for future resources and changes to procedures can be seen. So models are useful so long as they can contribute to an understanding of progress. Therefore they need to be relevant and transferable to differing contexts in their application as well as easy to use.

Appendix F

Interview with a Senior manager of an IS group from a major energy supply firm

Researcher - ...introductory explanation and discussion leading to the presentation of an organisational learning model from (Gilbert, 1995) ... What Myrna (Dr M. Gilbert) did, was construct a four stage model, Figure F.1, which proposed the knowledge transfer process, (where they identify the new knowledge requirements, (this is like the banking industry putting in information technology systems into their routine operations) or the way that knowledge has to work through the organisation (Gilbert, 1995).

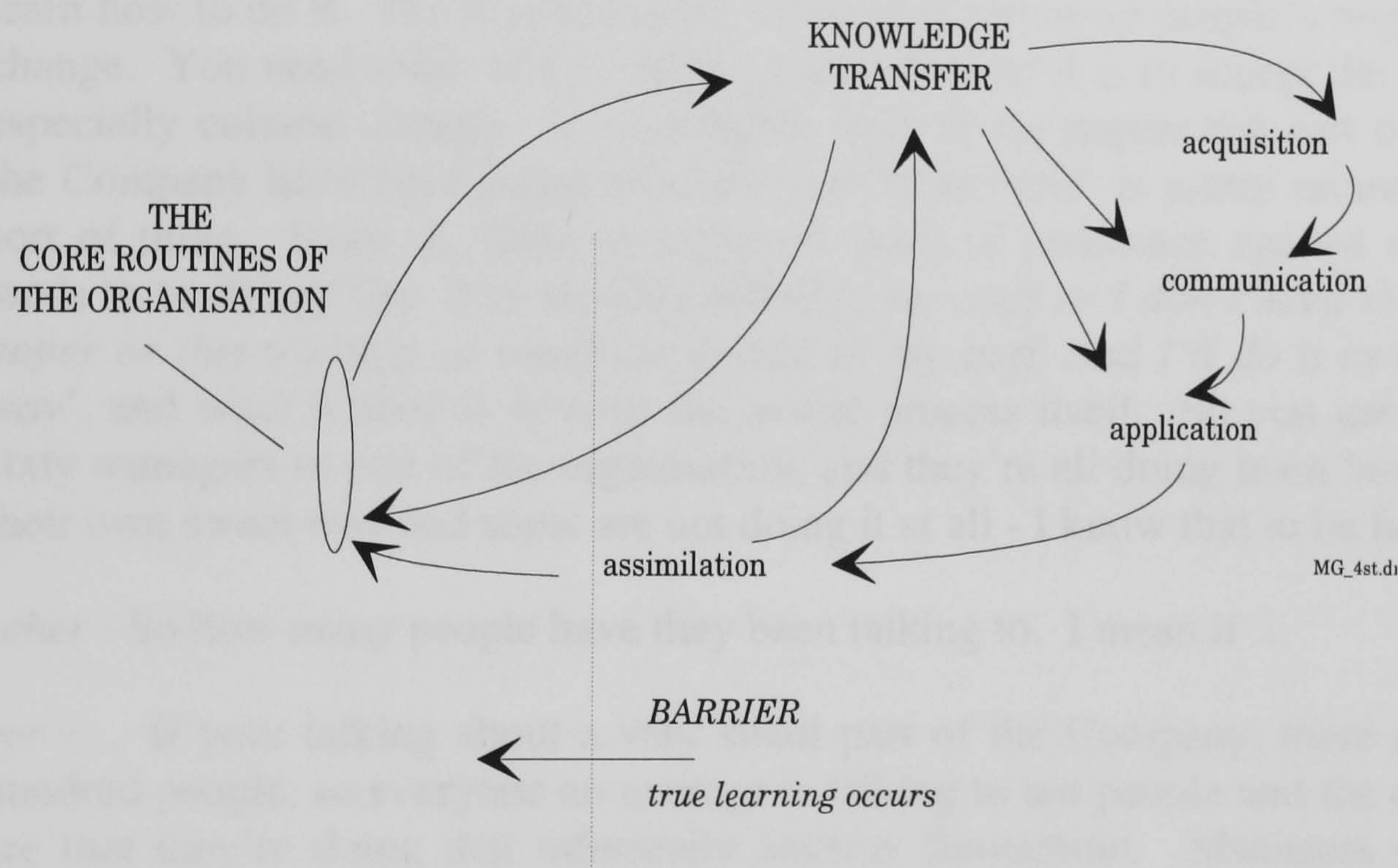


Figure F.1 The process of knowledge transfer in organisations (Gilbert, 1995)

Firstly they have to acquire it through some sort of training or mechanism, then the ideas have to be communicated in the firm and that would be either written in procedural manuals or through other training courses, or built in training to other people, then some form of application so that would be an actual hardware or software process change. She notes that there is 'this point' of assimilation where the people who've gained the knowledge then iron out all the products but don't come out with training at all so it becomes a routine part of the organisation, a routine factor and sometimes it will go back to recognising further knowledge needs or sometime it will stop there. My interest in the model is really one of the problems at this point - if you like- one of the problems where people have difficulty in either getting the right learning material, or the learning material that the top of the organisation is proposing does not match how the work place actually works, or in this case matches the new technologies. So I'm interested in any examples or anything that springs to mind that you may have come across in terms of training or operational changes where you get problems either in the way that people take on knowledge or, as

Myrna has identified a barrier here where people are resistant if you like to the change. I don't know if that sounds familiar at all or ...

Manager - One of the things I've seen over the years is that an organisation wants to undertake a culture shift. Now I know all my managers..., I can talk to their staff and that ought to be a two way process and I believe that is really important, if you haven't got the lower levels of management signed on, i.e. if you haven't explained it what tends to happen is that they go away on a course about 'team briefing' and say, 'this is a load of old piffle'. They come back, 'here you are go and brief your team about this', and it doesn't happen and you go round and round that loop, the Company have done this about three times now. They call it different things all the time the latest thing is called *team talk*, but what they have not done is actually solve the concept that this is where we want to go and this is why we want to do it because of the organisational change. All they're saying is we are going to add team briefs here and you're going on a course to learn how to do it. The expectation is that they'll speed up people's response to change. You need some sort of driver to get whoever it is to accept the change, especially cultural change. You probably read in the papers the sort of things the Company have been going through, and 'team brief' is pretty minor in that sort of thing. Even so, there is a ground swell of resistance against it and it tends to be things like '*I've already talked to my staff so I don't need this bit of paper or this training or whatever to talk to my staff, and I'll do it in my own way*', and what it does is devalue the actual process itself. So you get fifty or sixty managers in part of the organisation, and they're all doing team briefing in their own sweet way and some are not doing it at all - I know that to be fact.

Researcher - So how many people have they been talking to. I mean if ...

Manager - ... If your talking about a very small part of the Company, there are five hundred people, so everyone on average is talking to ten people and the chances are that they're doing that informally anyway throughout. Managers such as myself believe very much in the value of people who say that 'I will go round four or five times a day to see what my people are up to', not in a 'Big Brother' kind of way, but just because I care what they're up to and I want to show that - its no big deal sort of thing and I sort of resent someone saying to me that, 'you have got to talk to your staff', or I feel that, but I can see the value in team brief for other people. Equally there are people at the other end who don't tell their staff at all but believe they do (They) say 'I'm not going to do this because I already do it, and by the way its the third time we've gone down this particular route and it didn't work the first time and it didn't work last time and it didn't work the time before', and in that way you devalue the cost of that training. The outlay of that training - if you're approaching every manager of the Company, in my small part of the organisation there are four hundred managers, so if you multiply that by ... well there's 70,000 staff and if you say about 7,000 are managers - I don't know the exact figure now- that's quite a significant training outlay even if your doing them 10 at a time in a group.

Researcher- So you have 500 managers at ... [the old location]?

Manager - Sorry I should explain, I was working at [the old location] and I was using that as a model, I am now at [the new location] and I know as a fact there is four hundred within the Company 'supply side' - the domestic supply operation.

Researcher- So you have four hundred managers all set up for the team briefing programme, and the ratios of staff are about the same 10:1.

Manager - Spans are going out now, it's one of the ways the cuts in the management lies and it's ... good you are cutting a lot of waste but at the same time I can see as an individual they're still recruiting the same old managers who may be technically brilliant but are still are not talking to their staff, and if you make them responsible for an organisation of say 30 people, if they're not talking to their staff they might not be super efficient, with the rest of them... maybe were going off the subject a bit.

Researcher - No that's interesting because, ... one of my interests is that if you make structural change or you set up a training or a plan if you like, that implies a structural change later on ..., whether or not that structural change can be met at all, or whether its thought of as part of a training package?

Manager - What happens in the Company is that they say that 'this is the grand plan' and instead of doing a development type cyclical approach where you gradually build up on what you have done, what they tend to do is say, 'that's where we want to go, how do you do it, we want that, that, that and that' and training is one of that. It's not part and parcel it's a block that they use. They have done a similar thing with something called *interaction*, which was focused the other way, about staff talking to each other and how they interacted. Again this was, 'we don't think our customer facing teams were talking to the teams at the back to say what they want', ... 'so lets get everyone talking to each other.' Great concept, brilliant but you know it goes off half cocked again.

Researcher - So for that example was there obvious things they could have changed or ...

Manager - ... The one brilliant thing they could have done was actually mix the interaction groups and said right that's someone who's a customer support rep. someone's a marketing rep. someone's in finance and someone's in IT and mixed it all up that way. But what they did was they took ten people out of IT, or finance, they said to the individual finance officers, 'right you have got 100 people under you I want ten of them training on this day and ten training on that day,' y'know. It defeated the object and again they've gone round in a loop again. They say 'well I'm doing it!'

Researcher- Well that's interesting because the categories I'm looking at tend to fall into I suppose actually practical like organisational changes, how well they communicate down the hierarchy in the Company, so I've found lots of examples where for example they do technical training and -could be on design, CAD design systems or what ever- and people come back to the work place and the facilities aren't there - does that sort of event occur?

Manager - Oh yea. there is a step back from that, in that supposing you have a two tiered management structure in a department and you have twenty staff, so you have two managers and a top man. So the top man says 'I believe that everyone should be trained to use this particular product,' right that's a strategic decision for this particular department, although it may not be for the Company. But in truth there only ten of them working on that, but fair enough lets get flexibility in there so OK right we implement this. We say, 'good here it is, you have all been trained up now', and maybe the ten that are using it get the benefit from it or maybe they don't actually. You know I've got a view out there that says that there are people that are responsive to training and there are people who ... don't get much benefit from it depending on learning styles. They can often use another type of learning such as sitting down with them and actually showing them 'hands on' exactly what it is, but you've made the decision about spending. 20 peoples worth maybe £1,000 or £20,000 and you have maybe got benefit out of £5,000 when you built in a factor about learning behaviour. I believe quite strongly that what you need to do is - and it doesn't matter what the training was about - you need to say to the person who is sitting there the junior manager, office supervisor, 'we want this training done and this is why we want it done on your people', and again at the next level up you say, 'I want all the supervisors trained on this', so you say 'I want this training done and this is why I want it done', and then you start building in the value added, you start saying actually 'it doesn't matter how many times you tell Fred this, he is never going to pick it up.' I'll go on, the training and I'll take Fred through it a step at a time and maybe we'll learn by 'sitting with Nelly' or whatever.

Researcher- If they did say that, if they did go back through the hierarchy and said that this is why we do want to train people what do you perceive as being the reaction?

Manager - That's difficult because you get all sorts of people at that particular level. You have to take a view on that (person by person ? - *Researcher*) yea, but I think what you have got to say when in an organisation, if you've got a particular level of management you've got to have some sort of integrity. If I say I want all your staff trained in the best way you see fit, best value for money and I want them taught about the knowledge at the end of it. Then, that person has probably got the best knowledge about those individuals within the organisation. (So they're best suited to ensure that those people have understood? - *Researcher*) and if training and appraisal and everything else works properly in an organisation, again another can of worms, you should stay down with your people and say, 'you know how I feel, I feel you need to understand this and I think the best way for you to do that is this way,' and, 'how do you feel about it?' ... and you reach a mutual consensus that way. To me it's common sense, but I recognise that somebody sitting miles away from that, they say I want everyone to have that knowledge in the organisation and don't feel necessarily that they gain anything by involving everyone.

Researcher- That's where I came in I suppose because looking at distance learning which was by its very nature distant in production, and these problems I suppose where being highlighted and you couldn't see why, and yet the same problems seem to be evident all the way through different forms of training. Its just that

distance learning and technology based training focused very much on people saying they couldn't work out why they were not getting any results - if you like.

Manager - Well I've two experiences the video 'verse tracking' one was ... computer based training or something, it was basically a filler because I had some money left from a training project, it was basically an experiment for me to see how that went down. What I found was that people were very interested in going and seeing what was in this package but once they'd actually sat down and worked their way through them they came back - and because they were technicians pure and simple, technical support you know, real machine based gurus- they said yea but I did not get anything out of that package, if you would have given me a book within five pages I would have learnt everything in that, and yet there possibly was some value for perhaps someone sitting a step back, who may not have been so technically expert, maybe a junior or trainee. So you could of said here you are, here is an opportunity to learn UNIX right brilliant it would have caught fire. But as it was I wasted £5,000 because everyone looked at every package once and some of them got to the end of it, but I can't say that everyone did. But I got a fair amount of feedback on that, which shapes my own view in the future. The other one was about organisational change. The Company has been going through a fair amount of change since 1990, I said this before but this is the radical stuff, you know carving the Company up into chunks and saying right we'll make 25,000 people redundant. We bought a package for 'understanding change', its an American package I think, that has been adapted for the English market ... it's a very good package and I got a lot out of that (That's video based? - *Researcher*) yea an interactive video. The problem I saw with that was that if you want to spill your beans you don't want to do it through a P.C. if you want to say this hurts you don't want to tap it onto a screen as 'THIS HURTS'.

Researcher - Yea, (*Manager* - as I say it helped me) Is it a package and guidance, or interactive video or stand alone?

Manager - Stand alone. The idea was, we top & tailed it. I was one of the people responsible in my area, for getting people to do it. As I say nearly everyone we approached came to the first session, I found it was about 75% actually who did the first module and then you found that it just sort of tales off and about 10% finishes the course. Because you know - 'I'm British and I've got a stiff upper lip and I'm b-----d if I'm going to tell anything to anyone' and second 'Yea this really hurts and I don't want to tell a P.C., I want to tell my boss, I want to tell my, I want to tell anyone but I don't want to tell that damn machine' - because we are superior to the machine, I suspect.

Researcher - One of the points you raised was about flexibility when you were saying to build in some flexibility and send people on a course when you know they are not going to need it immediately but it may be of benefit in the future. Do you see that as having successful elements in it, a sort of investment or is it inherently problematic?

Manager -With technical training it doesn't work. I've never ever found it, and this is my experience, it never ever worked and it doesn't matter if its accountancy or

whatever. If they're not doing it now forget it, because they'll never take it in. You need it at the appropriate time, that's my view. But when it comes to management training it's different and I got a lot of benefit for me from sending six people on the NVQ level 4 (equivalent to the certificate of management studies) simply people came up to me and said 'Yea, I understand now, I understand why we did that and I understand this. I want to be part of what you're doing' and that helps me because when you are one manager trying to control ten or twelve technicians it's very very difficult because the level of expertise we are talking about is that I am a senior manager within the Company and all these people are employed by me, and maybe I earn less than them effectively - so we're talking about very senior technical levels and the problem is because they are very senior technicians they go their own ways. What happens is I'll give six of them management training and you can start pulling them back in again. I found that there was this - yes we now know why we need to tell you that we've gone out and done this because of the effect on the budget or its because - you know whatever reason - the budget is a good example-

Researcher - Yea, so even if they weren't using their skill in management they were understanding the context of what they were doing.

Manager - But in my view they were using them, they just weren't using them in the way that was expected. So my argument is that they were using the skills but not in what I call the pure management context.

Researcher - Yea, the implication so that they are learning skill, but they are not context specific. Where you're saying the skills training is absolutely specific, there is no transferability?

Manager - In my view, it is my experience.

Researcher - Yea, that's interesting because anything outside specific technical training there is a lot of concern about how you evaluate it, and all attempts at saying - like about management training, can you put a price on the investment you've made and the implications are that you either follow one route and you say that you cannot put a price on it therefore it has no value, or alternatively you say that it builds in a wider understanding and although you can't put a price on it, it is worth more than the original investment.

Manager - Yea that's where I guess that the Company doesn't have a grip on itself, it's been a nationalised industry and it's coming into the competitive market and what the staff didn't understand is how very lucky they were, I mean we are talking outwards of 6 and 7 weeks of training a year. I mean that's fantastic - I mean they'd point and say, 'Yes but I only went on two courses,' and I would say 'yes but you have done the management training course', and they'd say 'yea but that wasn't technical' but they have done *interaction* and this and that and that does add up believe you, me. I mean that in some of the periods that I'm talking about we got down to the fact that there was only about 40% productive work, and that's not just because of training that's saying that when you've got six weeks holiday and six weeks training and you know, *team brief* which are not productive, that 40% is very much based on what I call the

working week than the actual week, baring in mind that if they come to work 37 hours you know that they only work thirty hours, it is what I call the maximum by the time they have come in got their coffee in, gone to lunch come back,

Researcher- Only 40% of that effectively- Jesus, so do you think the climate is going to change.

Manager - Yea, Yea it has to, it hasn't done yet, I still recognise that, bearing in mind - I'm now a very junior part of a project, I still recognise that the computer manager within my part of the organisation is still saying 'you need to do that course' what he doesn't recognise is that he is employing me for how much a year and he's sending me away for two weeks. That's fine for me - I get trained - I came from local government where the view was very much that you don't send anyone on a course because the director is allocated a training budget and if he doesn't spend it he gets a certain percentage in his salary. (*Researcher* - Oh right!). That's how they implemented it in the council (previous employer) it might be unusual but its quite frightening, you know its like 5% or 10% of what's left is yours or whatever - so there had to be a very good reason why you went on a course.

Researcher - I mean that's an interesting example because it almost sets the trend for the way the Company might move if you have to then turn round and say I've got to send these people off, would you still go for management as well as technical or would you be pushed down the line of say I can only justify.... ?

Manager - What I have got is a certain 'sod you' mentality, I tend to work on the basis these days that everything I think should explain my background of being a manager of one sort or another since the age of 22, and what I recognise is that managers are there to get dumped on, either they get dumped up or they get dumped down on. As a junior manager you get both and you get promised things and it doesn't happen. So my own view is 'your telling me I'm going to get 5% at the end of the year - I don't believe you so I'll make sure my people are the best trained because I will get the best product and I'll get my productivity bonus from getting it done right'. I'll blow my training budget because I believe if for no other reason than by demonstrating the fact that I care more about them than I do about the 5%, I'll get a better product out of it.

Researcher - Yea that's an interesting example because I was talking to someone in civil engineering, he was saying the difficulty he was facing was choosing between training that should be based for institutional recognition like the Institute of Civil Engineers or training where if he sent someone on it would be training that would help their contractual position, say someone who'd been on a course for say geo-technics so they could put it on a CV of staff involved in a project and he felt himself pushed down a line of particular selection. And yet he saw his real problem as being how do you get people to reflect in the work place or change the way that they were working which was not in the majority of cases that type of course. Do you see, in the Company, yourself apart, that being a push?

Manager - I can't see the Company, being frightened by what the government has chosen to do to it, and what it's chosen to do to itself. But it still thinks its 'all money' even if the profit isn't there anymore. Again that's in my view. The Company isn't there in the mentality and I see examples of that time and time gain and for every cost conscious manager I see four who say 'all right if we go bust I'll find myself another job'. But in your example in my point of view I would be inclined to throw it back at the staff. I would say 'look I've got a budget here, this is what we can spend it on' and supposing you have got £8000 and it will only train about half your staff you say 'look this is where we are and what do you want to do about it' recognising they have then got to make some very hard decisions between themselves. There has to be a point in my view where you're paid to make the hard decisions, but there are decisions that you make hard if you try to make them without other people's involvement. I've certainly done that with (holiday ?). I've not done it with training yet because it is not an issue. Say when four or five people want the same day especially around Christmas, I say, 'look I'm not interested this is who I want, these are your options - sort it out for yourself,' and I would do that in training.

Researcher - Do you feel that people's approaches to training fall into clear camps - you said that there are people who are never going to take on learning, but do you feel that's due to training type or do you feel it's more to do with the individual?

Manager - It's a combination of both. I do recognise a bit of a crossed wire there, but going back to your point - I've forgotten your thread?

Researcher - It is whether that you see a particular type of course and you can see, 'yea that's a dead cert.', or in others you can ... Yea I mean that being a manager who knows his staff you obviously know who's going to respond well to which type, but is that *sort of knowledge* or *skill type* or is it 'I just know that these five people will always fit on a course and learn well?'

Manager - I think there it's a combination that there is getting to recognise their learning style and getting them to recognise their learning style, but there is also, yes your right, you prefer - take a very trite example- there's a PC. PC hardware they have got it there, one individual goes out on a course comes back home with the box and takes it apart, no problem. Another person will go there come back and say 'Ah there's the box there I'm not going to work that, I'll wait until somebody else comes and then I'll have a peer,' and sometimes, in my experience that individual's no better off for having been on a course because you can say to them the next time somebody opens the box, 'do you want to have a peer, do you want to want to get involved' and they say, 'yea' there, fine. That is about a learning experience but it's also about the technical area they're involved in because it's a PC. There is something in there that says, 'if I like playing with cars then I'll learn about cars, but if I don't like playing with cars then you can send me on as many car courses as you want but I'm not going to learn anything'. If there is somebody I know that is really comfortable with cars, (who) shows me what to do then I might be able to get over my fear.

Researcher - ... and get some enthusiasm to follow it up, yea exactly. That's what interests me, I suppose is whether there are different learning styles or different course styles but it's whether or not people fall into distinct categories I suppose. You where talking about the work you where doing could you just summarise or give a background to the, broadly the types of training or the type of work or if you like the group your working in, just a pen picture....

Manager - Do you want the whole career.

Researcher - Yea ... if you like.

Manager - OK you asked! I started off after leaving school as a trainee chef for a couple of weeks- chucked that, a garage mechanic chucked that. Worked with a firm of accountants as part of my training - chucked that after three years because well five years was a long time, went and joined the civil service as a finance manager. Got my first job in management there even though I'd done management and supervisory roles within the accountancy firm - a virtual job as a manger with the civil service. I started getting involved with computers in that job in about 1985. In the civil service they work on the basis of once you're very good at one job they move you to something else so they moved me to personnel, but I took the computers with me too. I was overseas personnel manager and I started dabbling with PC's and that, so I was managing staff overseas at the time so I was getting a systems development group around me so I had this 'double head' really at opposite ends of the spectrum talking to people and talking to the machines. My son was born in 1988 so I wanted to get a job locally so I came into local government and walked into things like the community charge package, recognised that I wasn't going anywhere there because they were top heavy and because of the training situation so I wasn't going to get too far in that particular sphere. I had had all this IT technical training within the civil service it was things like COBOL, Structure Design - all the buzz words that were around at the time. So when I walked into local government they said, 'you have a job, we're impressed', but after 13 months I said 'hang on I've brought all this to you but your not taking me anywhere' and said 'I'm off' and went to the Company at [the old location] and got into a really good environment, supporting mainframes and halfway through we got PC's in. My role was very much a technical role supporting PC's and mainframes. Just recently I mean, [the old location] is closing and the present structure of the Company is all disappearing and so I've moved to the Company supply side and I'm looking at client server products and how we release software into that environment. But that is very much at the end, I haven't had any training in there, a great period of training was between 1985 & 1988 with the IT stuff. A bit prior to that was with the accountancy firm because that was heavily based on training. And the four years at [the old location] that started off as very technically based because I needed to understand the environment, because before that I had not worked in that scenario. But more recently I think in 1991 I started a certificate, the BTEC certificate in management studies, I then went on to do the Open University Certificate in management and then the diploma. But I look at my colleagues and say 'OK you're a brilliant manager but how are you going to tell somebody else your a brilliant manager', 'ah well I've been on this technical course and that technical course' and I say that, 'yea I've done that

as well and I've got all those certificates and I've got things like quality auditing you know.' Somebody said 'do you want to go on a quality auditors course,' and I said, 'yep fine,' so I've got that certificate in quality auditing which I can show a potential employer, but I only do that if I can follow it up because I know me I'll forget it. So I just went round and said well you've got a nice ISO 9000 quality system can I do some auditing on it please. You know that's the way it happens. I mean management... I could talk about management until I'm blue in the face and I recognise I am becoming a bit of a bore (yea! - *Researcher* - jokingly) on management theory as far as certainly my colleagues are concerned. But what the Company does is say ah what's the subject again, what the Company never does is say, 'right we want you Mr ----- to do this project at [the new location] and that's going to have a structure, now what have you brought from [the old location]. It's not interested in that. It doesn't know I've got a diploma, it does not know I've got a certificate, it does not know I've got another certificate, it doesn't know I've got a quality auditing certificate.

Researcher - So you start afresh effectively?

Manager - Every time, every time you move location, where as with the civil service your career, your training and career followed you right the way through. Certainly with the accountancy firm, with there being only 11, your training record was *hung around your neck*.

Researcher - Yea, but that's an intriguing difference in organisations because the civil service are huge and so are the Company, do carry it around with you, effectively you're, ... you're labelled?

Manager - Well if I say anything about the civil service I may have to kill you! (jokingly?), but yea being a personnel manager I was aware that you had two files, you had a file which is all about yourself and another file which is about when you joined, all the courses, every time you do a course you fill in a record, This should go into this record file. Because of how the civil service works and says OK you're good at it now so we'll move you over there and see how good you are over there. They especially do it with the younger staff, for a potential employer, and that's the way it is looked upon they say well OK what does he know, and they say OK he's done this and this job and he's been trained in that and that. So they say fair enough.

Researcher- So you will be profiled for a given task?

Manager - Yea and the higher profile you had - using profile in a different way- within the organisation, i.e. you've got four box 1 reports (outstanding reports) and your being considered as a fast stream, that becomes more and more relevant so its more 'right OK its six months here ... right, right that's the bit that's missing there you are the next six months, one step promotion, two step promotions Its brilliant. People say that the civil service is rubbish, but well maybe you don't maybe that's just my own view of it, but they have actually got their heads round it very well.

Researcher so you see if the Company's environment changes, it sounds like a majority of your time at the moment is actually coping with change in the workplace rather than actual ... but I don't know if it is right... but what I would have imagined would have been supervision or a more supervisory role? ... Would I be right to say that historically, not in the sense of the management levels but is it because of the changes going on in the Company that you're having to actually cope with far more change.

Manager - I don't know I mean what I have had apart from this current move is that I have just sat at one desk in [the old location] and watched it all happen around me - and that's not easy to do because you apply for things and you say that you have to be a part of things and they say, 'no its all right don't worry'. So you sit there and go, 'there is something I'm doing wrong here', but a lot of things in the Company is networking and once you're in you're in and fortunately I've broken in now, I'm not sure of what I've broken in to. So because you have not got this personal file that goes with you no one knows who you are and what you are. You apply for each job, you say 'right I've done four years here' or I think [the old location] is going to close, you have got to submit an application form or maybe do a presentation and basically that's what their judgement is on. You know, myself and my colleague, I make no judgement about our technical ability, but there is the two of us within the same organisation, both at the same level, both have been in the job for about the same length of time and what you have got to do is that you have got to make judgements about who it is that you're going to select out of the two of us, and you have got no access to what I have done unless I tell you. The really strange thing is that when you do further education courses you fill in all these forms. They don't go in a personnel file, I didn't know where they had gone. They just disappear and you get a cheque to say ... they sent them all back to me. They said 'we now understand that you work for the Company supply side and here are your forms' - yea, well what good are they to me, why don't you bin them?

Researcher - The reason I was asking that was - what will happen as change goes on within the organisation to people who have got the level of experience that you have got? If they start selecting people out, will they, do you see them losing significant investment in knowledge and not having any control in that...?

Manager - Yea, they're not interested at the moment. The view is very much that we need to reduce numbers and we don't care who goes.

Researcher - So it is just a head count measure?

Manager ,- Well it appears to be. I recognise that some very valuable people at [the old location] were let go. Bearing in mind that our new project is setting up this client server, management model, and I recognise that there were people at [the old location] that could do that and they come at a premium. If you see that the client server is very much a new field (and when you talk about it everyone goes, *client server*) then you think about the processes afterwards. With IT it seems to be 'we'll buy the flavour of the month, we'll instal it,' but then it all falls round their ears and then they'll think about the process - how they should have installed it in the first place - and then they say 'we have a project.' This

isn't just the Company - the computer papers are full of it - but we had some very valuable people and we trained them for five years, - how much does that cost you and maybe it wasn't all technical training but maybe half of it was - it's got to be £20,000+ plus there is all the knowledge they have learned while they have been doing the job, so you turn round give them £20,000 and say here you are (?) you can have these we don't want them anymore - because you don't know what you have got or maybe you don't care. But I'm not bitter about it because we need to reduce staff and ultimately if they have all gone I've got the job.

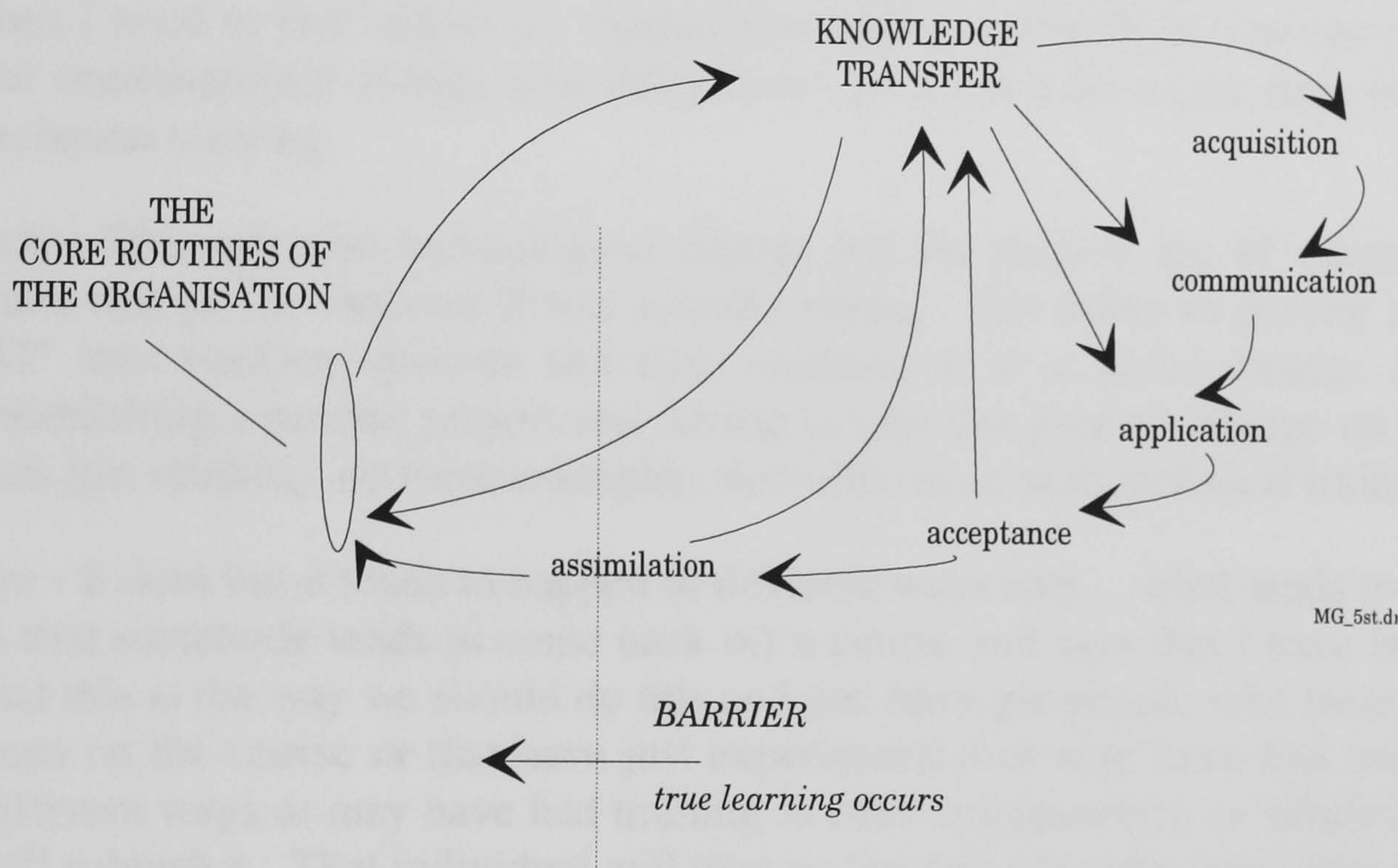


Figure F.2 The five stage model (Gilbert, 1995)

Researcher - Yea, and the question is about an anonymous system as well.

One of the last things I want to quiz you where Myrna puts forward this model, Figure F.2, and she makes a distinction later on about different managers role's. She identifies a barrier here (pointing to the model) on how organisations take things into the routine procedure, a 'four stage' model, Figure F.1, but lastly she introduces an additional stage here of actually 'how ideas are accepted' rather than just being taken into the routine. Here she is saying, 'for a manager to actually make structural change successful you actually have to achieve acceptance'. Here is the second example - some of the senior managers identify some of the route, areas of knowledge that are important, like the team briefing but there has to be an acceptance of that mechanism by the next level of managers if they are going to assimilate it, if they are going to put it forward... erm... can you think of other examples of that ... well team briefing is probably the one actually ...? but are there any other examples you can think of where you have training initiatives that rely on quite senior level managers, managers at your own level, where it is almost a personal judgement of discretion whether they take on board those ideas.

Manager - Yea I mean it tends to happen with all these in house initiatives ... there is a number, there's 'Team Brief' certainly, 'Interaction', there is another one called 'Understanding Working Relationships' and one called 'Customer

Focus'. A lot of those when they are brought into the organisation they go Bang! on the table - and it's 'all right you lot I want you to make sure that all your lot are trained' and maybe at the next level down, because they're sitting directly around the table with the *Manager* will say 'Yep we'll do that' but acceptance can happen here - you can say no I'm not doing that or acceptance can happen here - or sorry lack of acceptance here after acquiring the skills you can say 'well that was rubbish and I'm not doing that' I've seen that happen and even 'well I have had the skills I am now going to communicate to everyone in the department, they all think its rubbish and therefore that modifies me' and I'm perhaps one of those. If ten of my colleagues are telling me that's rubbish then I need to re-evaluate it. Application gain at every level you can say with the organisational change type things you can see it a lot easier than with pure technical training.

Researcher This refers to technological change but the project, the IT example you gave was perfect because it was actually saying - this refers to putting projects, 'IT' into backing systems and then realising it is a social change as well, establishing a parallel project and having to take this process change on board, I was just thinking are there examples, does this occur with technical training?

Manager - It does but it tends to happen in different ways erm ... what tends to happen is that somebody tends to come back off a course and says that I have been told that this is the way we should do this and you have got people who have already been on the course or that have just experienced it or may have had training in different ways or may have had training in other organisations or whatever, who will rubbish it. That individual will then go through the same loop, they will say 'all right I have communicated (Figure F.2) and they're all telling me that it is rubbish and again well I've tried to apply it and it doesn't work the way they said it would so do I accept it?' Even up here obviously the acquisition, with technical training the acquisition is not 'I don't want to go on a course' what I have found with technical courses is - and it doesn't matter what course it is - what it is, is the individual may rubbish it and say 'Aw I don't need that' but they will still go on it, simply because a lot of the time when you're talking about technical training you tend to be looking at people who aren't in anyway - its a bit of a generalisation but - within my recent experience people who get the technical training aren't necessarily managers, don't recognise the value of sending someone on a course in pure financial terms, so go along and think all right I'll go and put my feet up for a week because I think that it is rubbish. That's where you really loose out on it because they have got it up here they have just failed to accept it.

Researcher - I see what you mean - it's a route out?

Manager - Yea, I'll just put my feet up and wont have to worry about it but it happens much lower down. It's all about the individual and how they feel if they accept or reject it. Whereas with organisational development type stuff, management training and everything else, it tends to be rejected at a higher level. There will be a manager who says 'I don't want my people to be any part of this'.

Researcher- So in an actual hierarchical level someone says that this is appropriate or this is not appropriate to them?

Manager - That does not tend to happen with technical training perhaps because technical training is very much at a lower level of the organisation. You rarely get chief executives saying I want one of my staff trained in accountancy or IT or whatever. That tends to be a decision of lower level management but, 'I want one of my people trained in *team brief*', then that usually comes from the top.

Researcher - That's really useful, especially this notion about acceptance in different stages. So would you say in technical training that this is a bit more collapsed if you like, a faster cycle and that the stages ... less obvious.

Manager - There is one, one route I see in general that is all about the individual - which is about say a PC course - which is 'I'll go and put my feet up' or 'They all say its rubbish so I'll forget it' but, you're right with the organisation level development it happens at every level, everyone places a judgement on it. So the only way the chief executive can make sure that it is done is 'I want you to tell me how many of your staff have been on it' - it doesn't necessarily mean that the person at the bottom isn't just going to take a couple of days to go on it and put his feet up' everyone may have been trained in it but it doesn't mean that everyone was onboard.

Closing discussion